Equity in the utilisation of health care services in India: Implications for paths to UHC

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Abstract

Pursuit of equity in health and health care has been the key feature of health policy in India. Despite the policy significance, the volume of literature on this important topic is very inadequate in the Indian context. This paper, for the first time seeks to provide evidence on horizontal inequity in health care utilization in 16 major states and north-eastern region of India. The number of outpatient care visits in the past 15 days, number of hospitalizations and length of stay in hospital over 12 months period were extracted from 60th round (2004) data of National Sample Survey. All these measures of health care utilization were standardized for need differences using demographic characteristics and morbidity indicators and controlling for other socioeconomic factors. Need standardized concentration indices were used to measure income related inequities in health care utilization. Absolute inequalities are found between states in the proportion of the population reporting a visit to an outpatient provider, from as low as 4 percent in Bihar to as high as 22 percent in Kerala. Notwithstanding, after standardization, no violation of principle of horizontal equity is found in outpatient care in many states. Significant inequity is observed with respect to the utilization of inpatient care, favouring the rich in all states except Kerala, Himachal Pradesh and North-east. In light of the above evidences, it will be necessary to embed a pro-poor policy bias within the UHC framework to achieve equity in health care.

Key words: Horizontal equity; Health care utilization; Inter-state comparison, India

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Background

Pursuit of equity in health and health care has been the key feature of health policy in India, with the commitment to improve the access to quality health care by the poor and disadvantaged. This has been reiterated in almost all policy documents related to health, starting from Bhore Committee (1946) to the latest 'Universal Health Care Bill 2009'. According to these health policy documents, health systems in majority of states in India work towards eliminating the barriers in health care utilization and aim to achieve equitable access to health care, which is often interpreted as that person in equal need of medical care receives the equivalent treatment irrespective of her income or socioeconomic status. To realize this goal, it is imperative to make a systematic assessment of prevailing inequity in utilization of health care services which would provide guidance in identifying the points of policy intervention that can reduce the inequity in access to health care, a task that has so far not received serious attention both from academia and policy makers.

Despite the policy significance, the volume of literature on this important topic is very inadequate in the Indian context. Nevertheless, there have been some limited attempts in the past to examine issues related to inequity in health outcomes and access to health care. The past studies on health equity issues are mainly descriptive and limited in scope in terms of methodological and substantive exploration. Moreover, little is known regarding income-related inequalities and inter-state variation in horizontal inequities in health care utilisation.

The contribution of this paper is that it takes into account the need differences and controls for other socio-economic factors that affect utilization of health care services. Further, it aims to

assess to what extent the health care systems of major states and north-eastern region of India have achieved the goal of horizontal equity. i.e., equal access to health care for equal needs irrespective of income. Notably, the health economics literature suggests the use of 'utilisation' instead of 'access' for understanding the equity in health care as this would provide better insights into the factors responsible for inequity in health care use (Culyer, van Doorslaer, & Wagstaff 1992a; 1992b). To show the horizontal inequities in health care, I focus on utilization of outpatient and inpatient care.

The remainder of the paper is structured as follows: next section provides the comparative profile of study states and differences in their health care systems. Section III contains the description of data and some of its salient features. Section IV discusses the estimation techniques used. Section V presents the results and discussion of the data and finally it ends on the concluding note of Section VI.

II *Comparative profile of study states and differences in their health care systems*

India is a low middle income country with a population of 1.21 billion and a GDP per capita of $1,371. India spends about 4% of its GDP on health, majority of which is direct out of pocket payment and about 28% is government spending (Planning Commission 2008). Recognising the need for increasing public spending, Government of India has committed to enhance public spending from the current 1.2% to 1.58% of GDP by the end of 12th Five Year Plan (Planning Commission 2012). The sixteen states and one region considered in this study are large states having population of over 10 million and situated across the regions of the country. In spite of being split recently, Uttar Pradesh is still the largest state in terms of population followed by

Maharashtra. Though the remaining states are relatively small with a population between 25-100 million, their population size is similar to countries like United Kingdom or Thailand.

Since health is a state subject under the Indian constitution, the state governments are primarily responsible for providing budget allocations for maintaining adequate provision of health care services. The per capita public sector spending on health is awfully low in majority of the states than the comparator countries but there are notable inter-state differences, mainly between rich and poor states. For example, the per capita spending by the government of richer states namely Himachal Pradesh, Kerala, Punjab, Karnataka, Tamil Nadu, Maharashtra and Haryana was 2-4 times higher than their counterparts in poorer states- Bihar, Uttar Pradesh, Madhya Pradesh and Orissa (Table1). Although private health insurance is growing in most of the states, it plays a very minimal role in financing health care with only 5.4% of the total population as of 2009 having medical insurance at the national level (IRDA 2011). But there are considerable variations across states with Karnataka (10%) ahead of other states in protecting households against uncertain health risks (IIPS 2007).

Notwithstanding, the squeeze on public health spending coupled with low population coverage of insurance schemes with modest benefit package have forced the people of Indian states to rely on out-of-pocket (OOP) payments for financing health care. Notably, OOP constitutes between 60-80% of total health expenditure across states (Government of India 2009). Therefore, in all these states access to health care depends mainly on ability to pay than on health care needs and this demand factor has severely affected the utilization of health care by the poor leading to inequity in health care (Balrajan, Selvaraj and Subramanian 2011).

In all the states, public and private sector co-exist for provision of health care services. The services are provided at free of cost or for nominal fees at public health facilities. But because of the deficiencies in public health system, private sector has emerged as the dominant sector in the health care system of the country, accounting for nearly four-fifth of the outpatient care services and almost half of inpatient care in India (NSSO 2006). Despite apparent similarities in the health care delivery systems of different states in India, there are subtle differences in the characteristics of health care delivery systems of richer and poorer states. Commensurate with greater public health spending, the number of public health facilities at different levels is far more in high and middle income states than in economically weaker states (India Health Report 2010).

Also, the developed states are better placed in terms of health care infrastructure than the poorer states. For example, the doctor to population ratios in the relatively wealthier states of Punjab, Karnataka, Tamil Nadu and Kerala were about 4-20 times as high as the doctor to population ratios in poorer states such as Bihar, Madhya Pradesh and Uttar Pradesh. Significant variations are also observed in terms of each state's health and other developmental indicators. Health indicators are relatively bad in Uttar Pradesh and Rajasthan with very high infant and maternal mortality rates. In contrast, Tamil Nadu, Kerala, Himachal Pradesh and Maharashtra have achieved relatively low infant and maternal mortality rate. This holds true for fertility rates and other process indicators like immunization and institutional delivery (**see Table 1**).

II Data

Cross-sectional data are taken from National Sample Survey Organization's 60th round survey on 'morbidity and health care'. This survey is both nationally and state representative and it included responses from 383338 usual members of the households covered in the survey for the period 2004. It collected information on individual and household socioeconomic backgrounds, ailments, utilization of health care services provided by public and private sectors and out-of-pocket health payments. The sampling design was stratified in two stages with census villages and urban blocks as the first stage units (FSUs) for the rural and urban areas, respectively, and households as the second stage units (SSUs). The survey period, January-June 2004, comprises two sub-rounds of 3 months each. The rural and urban samples of FSUs were drawn independently with two sub-samples and equal numbers of FSUs of each sub-sample were allocated for the two sub-rounds to ensure an equal spread of sample FSUs over the entire study period.

III Methods

Measurement of equity

Equity in health care utilization is often interpreted as persons in equal need of medical care receive the equivalent treatment, irrespective of their household income or socioeconomic status. Therefore, according to the principle of horizontal equity, the measure for comparison among the states is inequality in outpatient care by income that remains after standardization for health care need differences. Nonetheless, need is mostly intractable in large scale surveys and therefore, quantification remains a major challenge (Culyer 1995; Culyer and Wagstaff 1993). The perception of health and disease varies according to culture and socioeconomic background and

hence, the researchers have often relied on demographic characteristics and morbidity indicators for standardization of health care need, while controlling for non-need variables like education, social group, region etc.

Therefore, in this study, I utilize the available information on health care need such as the reported health status of population and other need related characteristics such as age and sex for estimation of need-standardized use of outpatient care. In other words, need in this context, is defined as the outpatient care that an individual is expected to receive, given her age, gender and self-reported health status. Following the estimation of need-standardized outpatient care use, concentration index is calculated for measuring the magnitude of inequity. These are described in the measurement details below.

Measurement of horizontal inequity in healthcare utilization

The magnitude of horizontal inequity in outpatient care utilization is measured using the standardized outpatient care utilization rate. The variable outpatient care use is typically non-negative integer counts with large proportions of observations with no utilisation and therefore, it would seem proper to use non parametric models for estimation of need-standardized outpatient care. I have found elsewhere that the inequity results vary very little when non linear models (e.g., double-hurdle models) are used instead of OLS (van Doorslaer, Masseria, and OECD Health Equity Research Group 2004; van Doorslaer et al. 2000; Wagstaff and van Doorslaer 2000). Therefore, in this study, a linear regression equation is used to standardize the outpatient care utilization. The methodology for standardizing health care utilisation rate can be found elsewhere (For details see: O' Donnell, 2007). However, a brief description of the equations used

for standardization and the method of calculation of concentration index used for analyses is presented below. The regression equation is represented by

$$y_i = \alpha + \sum_j \beta_j x_{ji} + \sum_k \gamma_k z_{ki} + \varepsilon_i \text{ -------------------------------- (1)}$$

where y_i is outpatient care utilization rate; i denotes the individual; and α, β , and γ are parameter vectors. The x_j are confounding variables such as age, sex and self-reported health status which need to be standardized, and the z_k are non-confounding variables such as place of residence, social group, region, income and education which are included not to standardize but to control for in order to estimate partial correlations with the confounding variables (Gravelle 2003; Schokkaert and van de Voorde 2004). In this study, income was measured by proxy variable-'per capita monthly household consumption expenditure'. Ordinary least squares (OLS) parameter estimates ($\hat{\alpha}, \hat{\beta}_j, \hat{\gamma}_k$), individual values of the confounding variables (x_{ji}), and sample means of the non-confounding variables ($\bar{z}_k$) are then used to obtain the predicted, or "x-expected," values of outpatient care utilisation $\hat{y}_i^x$:

Estimates of indirectly standardized health, $\hat{y}_i^{is}$ are then given by the difference between actual and x-expected health, plus the overall sample mean ($\bar{y}$),

$$\hat{y}_i^{is} = y_i - \hat{y}_i^x + \bar{y} \text{ -------------------------------- (2)}$$

The distribution of $\hat{y}_i^{is}$ (e.g., across income) can be interpreted as the distribution of health that would be expected to be observed, irrespective of differences in the distribution of the x's across income. Following this, the health inequity index (HI) is calculated by computing the concentration index with the following formula (Kakwani, Wagstaff and Doorslaer, 1997) given below.

$$2\sigma_r^2\left(\frac{h_i}{\mu}\right) = \alpha + \beta r_i + \varepsilon_i \quad \text{---------------------------- (3)}$$

where h_i is the standardized health care utilization rate, μ is its mean, $r_i = i/N$ is the fractional rank of the individual i in the distribution of monthly per capita household consumption expenditure, with $i=1$ for the poorest and $i = N$ for the richest, σ_r^2 is the variance of the fractional rank. The OLS estimate of β is an estimate of the concentration index. A zero value of HI index indicates horizontal equity exists, i.e. the proportionality between use of medical care and need for health care is the same, irrespective of household income. When positive, the index indicates pro-rich inequity and when negative, it indicates pro-poor inequity. In other words, inequity is captured here by the difference between inequality in utilisation and inequality in need; if inequality in utilisation is less than inequality in need, then the measure of inequity is positive indicating the inequity favours the non-poor (van Doorslaer and others, 2000).

IV Results

Inequity in health care utilization

The objective of this section is to quantify the magnitude of income-related inequity in outpatient and inpatient care utilisation. Figure 1 and 2 present the inter-state comparisons of the mean level of health care utilisation: the probability of any outpatient visits/hospitalization and the mean frequency of visits. The outpatient care rate was 7.6 percent at the national level. However, there were significant absolute inequalities across states. The proportion of the population reporting a visit to an outpatient provider varied from as low as 4 percent in Bihar to as high as 22 percent in Kerala. Variations across states are also seen for number of visits to the outpatient provider (for persons who have made at least one visit), with Bihar having the lowest mean number of outpatient visits (1.004 visits), and Andhra Pradesh the highest one (1.11 visits) (Figure 2). In

case of inpatient care, the national average i.e., 2.4 percent masks the huge inter-state inequalities in annual hospitalization rate. It varied in the range of 1 to 10 percent. The probability of being admitted in hospital was very high in Kerala (10 percent), Tamil Nadu (4 percent) and Maharashtra (3 percent) but it was low in Bihar (1 percent), Uttar Pradesh (1 percent) and North-east (1 percent). The absolute differences between states in the mean hospitalization rates among hospitalized persons are not found to be as large as the previous measure (Figure 2). While the mean hospitalization rate was lowest (1.03 times) in north-eastern states, it was highest in Kerala (1.27 times).

Inter-state differences in income-related inequity in outpatient care use

In this section, the inter-state comparisons of the results of horizontal inequities in need-standardized outpatient care by income are presented. Total outpatient care was broken into two parts: probability of visiting an outpatient provider and number of outpatient care visits. Figure3 depicts the magnitude of income-related inequity for probability of visiting an outpatient provider after controlling the need and non-need factors. Adjusting for age, sex and health status and other non-need factors, the results reveal that the magnitude of inequity for outpatient care contact was pro-rich for India and for some of the states.

The extent of inequity in outpatient care differs from one state to the other. Although it appears that states, at the upper end of the development spectrum such as Kerala, Himachal Pradesh, Punjab, West Bengal, Haryana, and Maharashtra, achieved nearly horizontal equity in outpatient care utilization, it does not necessarily imply that the distribution of outpatient care is equitable in these states because of the fact that a significant proportion of poor people probably did not report any health problem, primarily because of low health ideals compared to their wealthy

counterparts. But given the fact that differences in actual and perceived health need and health seeking behavior exist across income groups in all these states, it can certainly be inferred that the poorer people have better access to outpatient care in these middle and high income states. Thus, the hypothesis that development is associated with greater inequality stands rejected in this case. Furthermore, contrary to the results of the probability of visiting outpatient provider, almost all the states showed fairly equitable distribution for the mean outpatient visit frequency.

Inter-state differences in income-related inequity in inpatient care use

In this section, the inter-state comparisons of the results of horizontal inequities in need-standardized inpatient care use by income are presented. Total inpatient use was disaggregated into probability of hospital admission and mean length of stay in hospital (conditional use i.e., given that the person spent at least a night in the hospital). Both these measures of inpatient care are measured and quantified across all states.

Inequities in the probability of hospitalisation

The observed distribution of hospital admission was pro-rich, as indicated by positive health inequity (HI) index values for all-India level and most of the selected states. This implies that in majority of the states, the high income groups use inpatient care more than the lower-income groups. HI index for inpatient care varied in the range of -0.02 to 0.21 for all the selected states. While no violation of horizontal equity principle was found in Himachal Pradesh (HI=0.00), Kerala is the only state in which the distribution was pro-poor (HI=-0.02).

As expected, there is an inverse relationship between the income inequity in hospital admission and the level of per capita public health spending by states (Figure 4). The gradient is steep,

indicating that this relationship is strong. This means that as the per capita public spending on health care increases, the inequity in the probability of being admitted in hospital by income decreases.

Inequities in Conditional Mean Length of Stay (LOS)

The distributional pattern for conditional mean length of stay in hospital (i.e., given at least one night spent in hospital) seem to be very similar with the probability of hospitalization. The need-standardized distributions of 'mean length of stay in hospital' were significantly pro-rich at the all-India level and most of the states except in Kerala, Himachal Pradesh and north-eastern region where the inequity indices for mean length of stay were pro-poor. In other words, the better-off were more likely to stay at least one night in the hospital after standardizing for the needs of the population.

However, there are notable differences between and within the states. For example, the HI index was more than 0.15 in eight states: Rajasthan (0.16), West Bengal (0.16), Gujarat (0.17), Haryana (0.17), Bihar (0.18), Orissa (0.19), Andhra Pradesh (0.20) and Uttar Pradesh (0.25). The value of HI index was more than 0.07 in the other 5 states. While the two other states namely Himachal Pradesh (0.01) and Kerala (0.04) are close to achieving horizontal equity, the distribution of 'hospital stay' was significantly concentrated towards the worst-off in North-east (-0.42). This is not surprising since public health spending was considerably high in these states and the population served per public bed was relatively low among the states. This implies that inpatient care utilization rate of the poor was relatively high in Kerala, Himachal Pradesh and North-east compared to other states.

In contrast, in all other states, better-off stayed for a longer time in hospital, though the health conditions of the poor are expected to be poorer than the rich people. This situation emerged as a result of the high out-of-pocket health payments associated with utilization of inpatient care in those states. Since the poor people could not afford high quality of care, the inpatient care utilisation rate of the poor was very low compared to the rich, despite their greater health care need. This probably explains why the distribution of average length of stay (given that the person spent at least a night in the hospital) was concentrated among the rich in majority of states in India.

Discussion and Conclusion

The results of horizontal inequity in health care utilization in India clearly suggest that utilization of both outpatient care and inpatient care was associated with income at the country level. In other words, people with similar needs continue to receive varying levels of health care depending on their income i.e., ability to pay. Nevertheless, in India, the income-related differences in outpatient care utilization vary enormously from state to state but many of them are close to achieving equity. The following reasons may explain why there is no income related inequity in ambulatory care in those states. Physical access to ambulatory care is not an issue in most of these states as it is widely available even in poorer states that otherwise do not have good health infrastructure. The health care providers are highly heterogeneous in the market for ambulatory care consisting of faith-healers, semi-qualified practitioners, AYUSH and allopath doctors. As these informal providers and AYUSH practitioners provide treatment at relatively low cost, even the poor tend to approach them when needed.

Unlike outpatient care, the distributions of different components of inpatient care show a very different picture. In majority of the states, the distributions of hospital admission and mean length of stay in hospital are considerably concentrated among the rich. There are significant disparities across states. Kerala, Himachal Pradesh and North-east have considerably lower values of HI indexes for probability of hospital admission. In contrast, the collection of poor states known as EAG (Uttar Pradesh, Madhya Pradesh, Orissa, Rajasthan and Bihar) showed pro-rich inequity in hospitalization rate. Some developed states like Punjab and Andhra Pradesh also have large HI indexes.

Like probability of hospitalization, the distribution of 'average length of stay in hospital' also seem to favour the rich people significantly in most of the states with the exception of Kerala, Himachal Pradesh and north-eastern region. Looking at the need-standardized concentration indices for outpatient and inpatient care for each state, it is clear that the people in the lower consumption expenditure quintiles would have needed more medical care than they actually received. Even though the distribution of medical care is in favour of the lower consumption expenditure groups in Kerala, Himachal Pradesh and North-east, it is not adequately skewed towards the bottom end of the consumption expenditure distributions to compensate for the higher needs of the worst-off.

The analysis of the relationship between horizontal inequity in hospital admission and per capita public spending on health reveals that states with higher per capita public spending on health, on average, have a lower level of inequity in inpatient rate. Clearly, the higher spending on health care by the state governments increases the ability of the public health facilities to provide

quality health care and thereby improves the utilization of inpatient care by the poor. The exceptions are Punjab and Andhra Pradesh where the level of inequity in inpatient care is high and pro-rich. More in-depth analyses are required to understand the reasons for rich-poor gap in inpatient care utilization in those states.

The findings of the study have profound policy implications. The heterogeneity of the challenges to health care in each state demands context specific solutions for reducing inequities in health and health care. Of late, there have been some major changes in the health policy and programme domain in India. The health sector received the major boost from the government when the National Rural Health Mission was launched in 2005 to strengthen the public health system with the aim of improving the availability of and access to quality health care for the rural population (Government of India 2009). However, in the absence of a systematic evaluation of NRHM and other central and state government-funded health insurance schemes, it will not be possible to make an inference about the health care equity impacts of these programmes (Gill 2009; Bajpai, Sachs and Dholakia 2009; Reddy et al., 2011). In fact, a recent paper on the preliminary evaluation of government's flagship programme *Rashtriya Swasthya Bima Yojana* (National Health Insurance Scheme for the poor), has shown that the insurance scheme has failed to provide the financial security against cost of illness amongst the poor (Shakthivel and Karan 2012).

It is noteworthy to mention that the government is likely to announce the roll-out of 'universal health coverage' (UHC) programme by next year. A framework has already been laid out on how to implement the programme and the piloting is likely to start in some states soon (Government

of India 2012). While the recommendation of the high-level expert group (HLEG) on health is to provide a comprehensive health package to all citizens, many believe that this may not be feasible in the immediate future as the state governments will not be able to match the increased allocations on health committed by the central government necessary for provision of such package. Therefore, the government may settle for the 'breadth of coverage' and not the 'depth of the coverage' as seen in other comparator countries such as Philippines and Ghana where the SHI programme was rolled out to achieve universal health coverage.

In light of the evidences that people with lower economic background under-used both outpatient and inpatient care than their richer counterparts at the all-India level and most of the states, it will be necessary to embed a pro-poor policy bias within the UHC framework to achieve equity in health care.

Limitation of this study

The quality of data on 'self-reported health status' needs to be improved. The health status of individuals was assessed using the information whether a person reported an illness in the past 15 days. In areas of poor health care access, morbidity level may actually represent health care utilisation levels, rather than the actual health status. Typically, in developing countries, despite poor health condition, the poor are less likely to report ill-health compared to their 'better-off' counterparts due to low level of 'health ideals' (Dilip, 2002; Murray 1992). Therefore, the results are subject to limits of self-reported morbidities. Also, it is to be noted that controlling only the presence or absence of disease may not give actual need-predicted estimate of health care use as

the differences in the intensity of health care use may be better explained by the severity or nature of illness which could not be controlled in this study.

Figure1: Outpatient care and hospitalisation rates (percent) in 16 major states and India within 15 days and 12 months prior to the survey date respectively, 2004
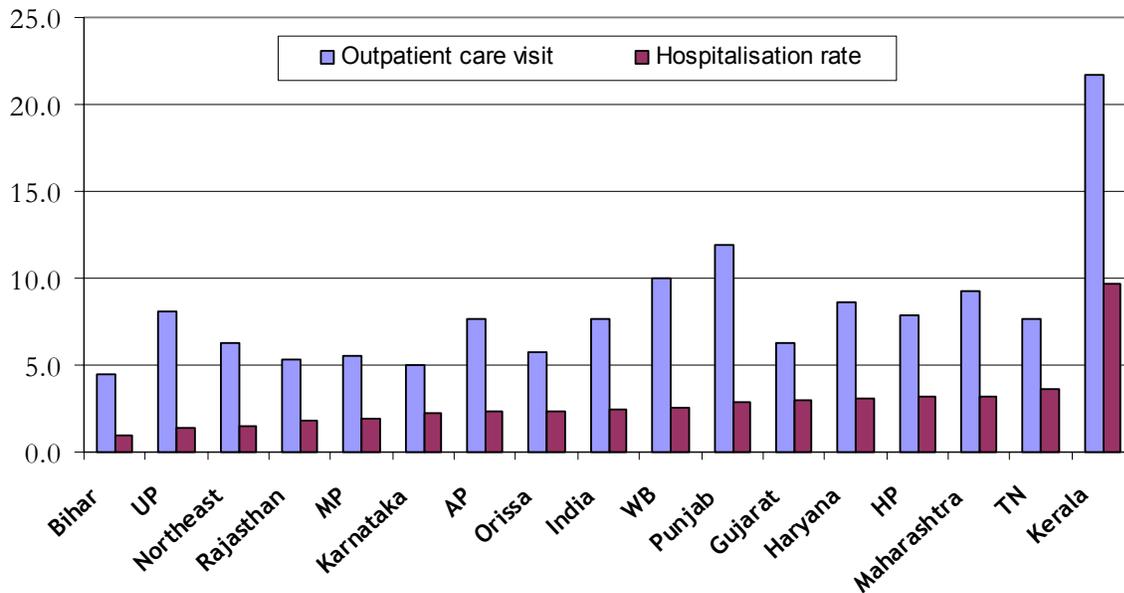
Figure2: Mean number of outpatient and inpatient visits in 16 major states and India within 15 days and 12 months prior to the survey date respectively, 2004
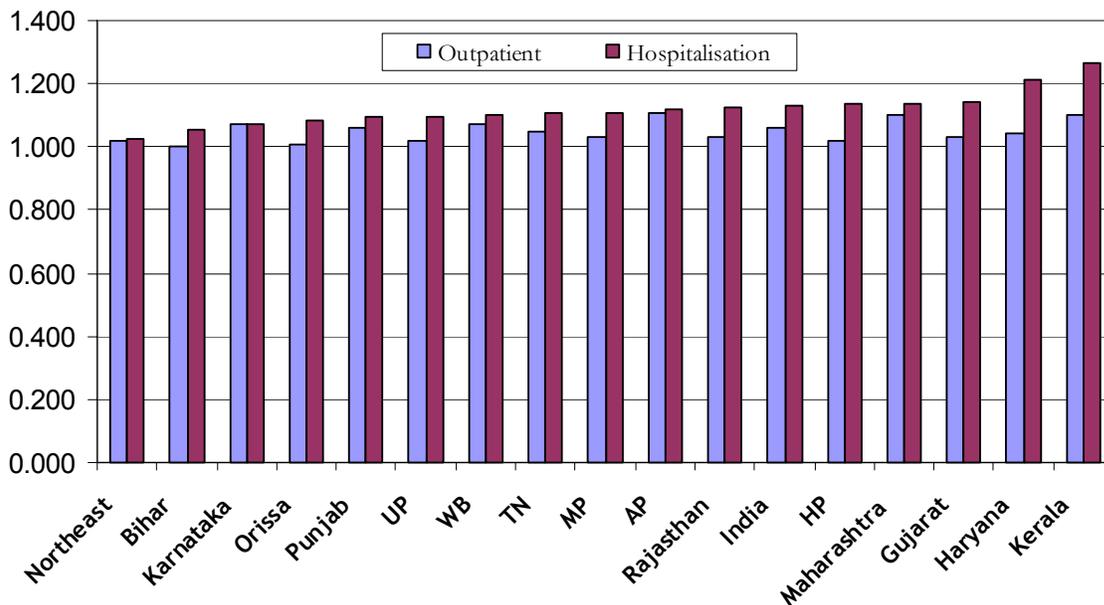
Figure3. Horizontal inequity indices for the probability of visiting an outpatient provider and seeking inpatient care in 16 major states, 2004
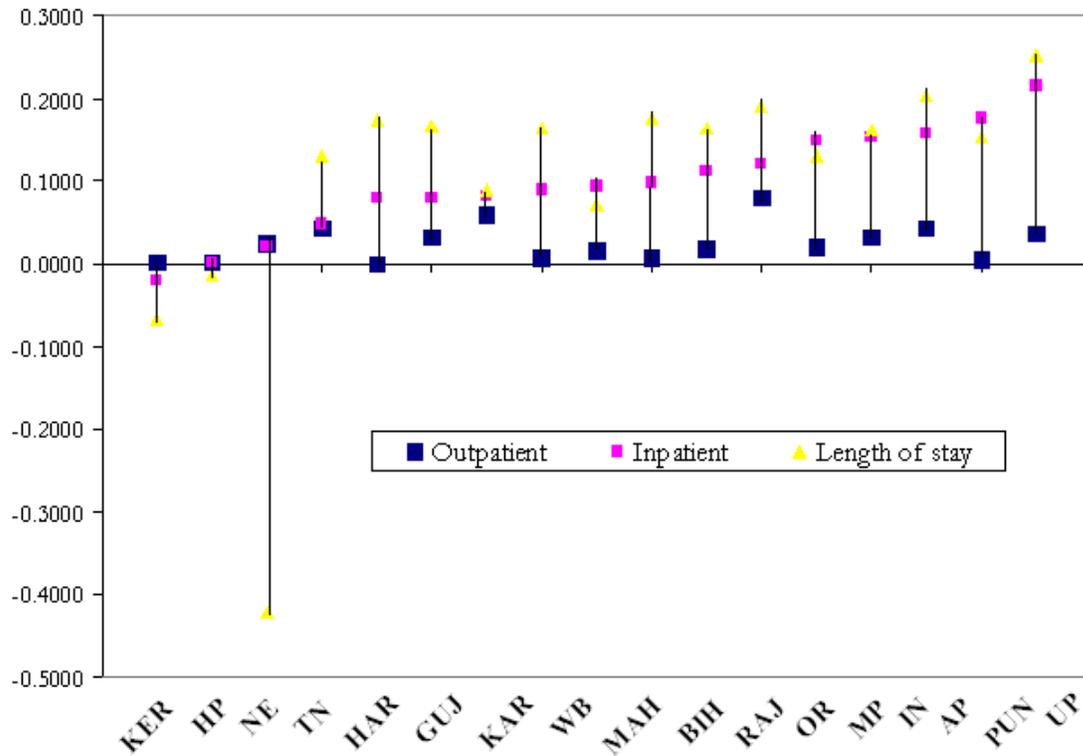
Figure4. Relationship between per capita public health spending and inequity in hospital admission
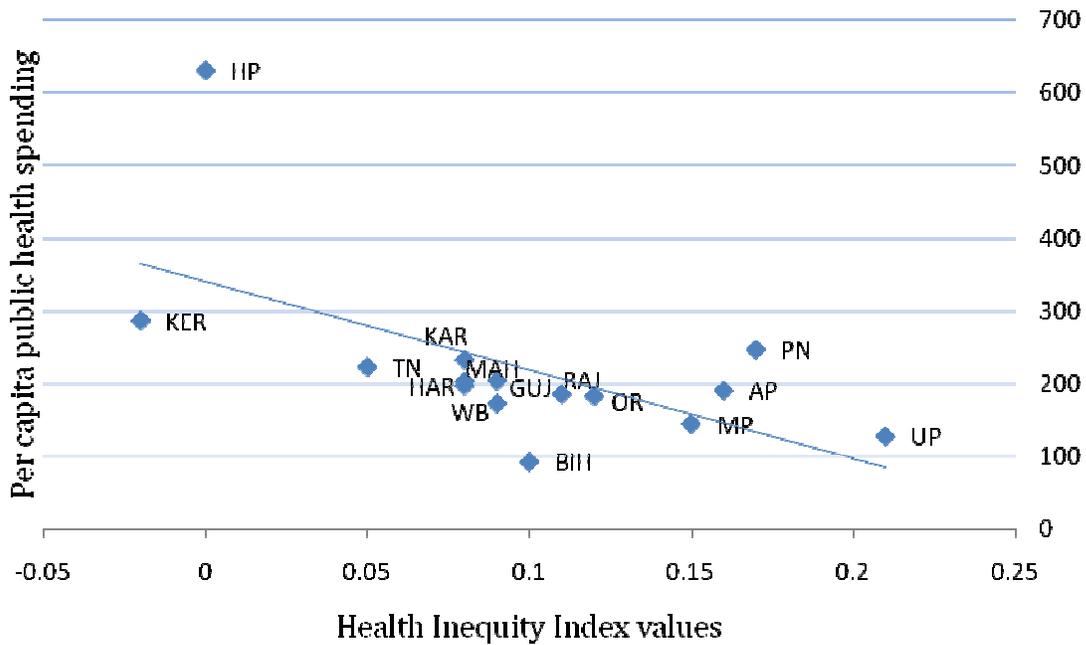
Table1. Profile of states in 2004

States / Indicators	Total Population1 (in million) 2004	Infant Mortality Rate2 2004	Population below Poverty line3 (%) 2004-05	Population served per govt. hosp. bed	Net State Domestic Product per capita5 (at current prices)	Per Capita Public spending on health6 (in Rs) 2004
Bihar	87.74	61	54	-	5772	93
Uttar Pradesh	176.37	72	41	-	11477	128
Rajasthan	59.98	67	34	2347	16212	186
Orissa	38.08	77	57	2363	13601	183
West Bengal	83.32	40	34	1560	22497	173
Maharashtra	101.62	36	38	2356	32170	204
Punjab	25.38	45	21	2045	30701	247
Haryana	22.45	61	24	3750	32712	203
Andhra Pradesh	78.97	59	30	19214	23135	191
Karnataka	54.93	49	33	1779	23945	233
Tamil Nadu	64.10	41	29	1440	25965	223
North-east	40.56	-	-	-	-	-
Kerala	32.71	12	20	1077	27048	287
Madhya Pradesh	64.00	79	49	3770	14069	145
Himachal Pradesh	6.41	51	23	1244	27485	630
Gujarat	53.29	53	32	2014	28335	198

Sources:
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