Suryanarayana, M. H.; Agrawal, Ankush

Working Paper

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Working Paper, No. 109

Provided in Cooperation with:
International Policy Centre for Inclusive Growth (IPC-IG)

Suggested Citation: Suryanarayana, M. H.; Agrawal, Ankush (2013) : Promoting human development in India: Costs of inequality, Working Paper, No. 109, International Policy Centre for Inclusive Growth (IPC-IG), Brasilia

This Version is available at:
https://hdl.handle.net/10419/101114

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M.H. Suryanarayana
Indira Gandhi Institute of Development Research, Mumbai

Ankush Agrawal
Indian Institute of Technology Delhi, New Delhi

International Policy Centre for Inclusive Growth

International Policy Centre for Inclusive Growth (IPC - IG)
Poverty Practice, Bureau for Development Policy, UNDP
Esplanada dos Ministérios, Bloco O, 7º andar
70052-900 Brasilia, DF - Brazil
Telephone: +55 61 2105 5000

E-mail: ipc@ipc-undp.org ▪ URL: www.ipc-undp.org

The International Policy Centre for Inclusive Growth is jointly supported by the Poverty Practice, Bureau for Development Policy, UNDP and the Government of Brazil.

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Print ISSN: 1812-108X

PROMOTING HUMAN DEVELOPMENT IN INDIA:

COSTS OF INEQUALITY

M.H. Suryanarayana and Ankush Agrawal*

ABSTRACT

Policy emphasis in Indian economic development planning has always been on 'economic growth with income redistribution'. Such a strategy seeks to exploit the potential of development programmes for poverty reduction and welfare gains by reducing the costs due to inequality in income distribution. The state of Kerala provides an empirical example to show how it is possible to achieve both growth and improved income distribution by human development, which is also acknowledged by the Government of India. The three critical dimensions of human development identified by the UNDP are (i) a long and healthy life; (ii) knowledge; and (iii) a decent standard of living as measured by per capita income. There is ample scope for achieving economic growth, human development and poverty reduction by reducing the extent of inequality in all these three dimensions of human development. Therefore, this study seeks to quantify the loss in human development due to inequalities in these three dimensions across states in India. This is done using the methodology to estimate a new index called the Inequality-adjusted Human Development Index (IHDI) proposed by the UNDP in its *Human Development Report* for 2010 entitled *The Real Wealth of Nations: Pathways to Human Development*.

The HDI is a measure that summarises average levels of achievements in each of the three dimensions in terms of unit-free scores obtained by normalising their respective measures with reference to exogenous limits called goalposts. To facilitate international comparisons, the UNDP specifies the goalposts in the global context. To contextualise the HDI estimates with reference to feasibility defined by the country's potential, this study has made appropriate revisions to the goalposts with reference to the mainstream states in India. This is done in terms of order-based statistics, since mean-based estimates are misleading when the distributions of variables under review are skewed.

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* M.H. Suryanarayana, Indira Gandhi Institute of Development Research, Mumbai and Ankush Agrawal, Indian Institute of Technology Delhi, New Delhi.

An earlier version of this study has been reported in the Indira Gandhi Institute of Development Research publication titled *India Development Report 2012–13*, which is based largely on policy studies undertaken at the Institute.
The authors thank Tushar Agrawal for generating estimates of average years of schooling and inequality in education, S. Chandrasekhar for estimates of school life expectancy, Jitendra Asati for helping us in getting files for Indian states into shape, K Seeta Prabhu, K.L. Krishna and an anonymous referee of the International Policy Centre for Inclusive Growth for comments and suggestions. Corresponding author's email address: surya.igidr@gmail.com.

This study reveals a substantial loss in human development due to inequality in different dimensions across states in India. Among the three dimensions, the potential lost due to inequalities is highest in education. This conforms with the findings in the global context reported in the UNDP *Human Development Report 2010*. Similarly, the extent of inequality is staggering in the case of health. Many studies have pointed out marked differences in access to health care and its utilisation. As regards health and education, the results show low levels of attainment characterised by a high level of inequality. Given the pronounced growth that the country has witnessed during the last decade, policies promoting economic growth, education and health need to be integrated with those addressing their respective distributional dimensions. Thus, our results provide useful policy insights for a strategy seeking to promote human development through a distributive policy option— that is, addressing inequalities across dimensions in different states in the country.

1 INTRODUCTION

Development planning in India has sought to improve the population's economic status through a strategy of 'growth with redistribution' right from its inception. This strategy involves the simultaneous pursuit of policies and programmes that both promote income growth and redistribute income to reduce inequality. While the growth is measured in terms of mean-based estimates of average income, the redistributive policy option is generally conceptualised and measured in terms of a reduction in the extent of inequality in consumption distribution. For instance, the Technical Note on the Sixth Five Year Plan simulated poverty reduction under alternative scenarios of (i) 'growth', and (ii) 'growth with redistribution', with reference to estimates of Gini ratios of consumption distributions (Government of India, 1981). Such an exercise permitted quantification of the potential loss in achieving targets if a country pursued an 'only growth' policy option and ignored the extent of inequality in income distribution. In other words, it permitted verification of the scope for poverty reduction of a redistributive policy option.

A similar syndrome prevails with respect to a pursuit of human development. Successive planning exercises have emphasised promoting achievements with respect to average levels of different dimensions of human development. India has not seriously explored the scope for reducing unequal achievements in education and health,[1] which have a crucial bearing on economic growth as well as final income distribution. Given the current policy emphasis on inclusive growth and eradicating multiple dimensions of deprivation,[2] this paper seeks to quantify the extent of loss in human development due to inequality across its dimensions in different states as well as the country as a whole. In other words, it examines the scope for promoting 'human development' through improved distribution. Unlike an income redistribution strategy for a given income level, which would involve net transfers between two segments of the population through instruments such as taxes and subsidies, the option to reduce inequality in health and education would not involve any transfer or redistribution. Instead, an improvement in the health and education status of the deprived sections of the population would invariably involve positive externalities for the entire community, resulting in an improvement in level as well as distribution.

This study explores the issues discussed above using the methodology proposed to estimate Human Development Index (HDI) and the Inequality-adjusted Human Development Index (IHDI) in the *Human Development Report 2010* (UNDP, 2010). The methodology provides a comprehensive framework to address issues related to human development, inequity and inequality ever since the UNDP introduced the concept in 1990 and initiated a series of studies. The UNDP advocacy is to keep people at the centre of the development process. The first *Human Development Report*, published in 1990, proposed the concept of human development. It introduced the HDI, a combined index of three dimensions of human well-being—namely, standard of living (income), education and a long and healthy life—which has become a useful tool in welfare policy formulations for countries across the world. The human development paradigm emphasises that the people are the real wealth of a nation and seeks to enlarge people's choices, especially in terms of their abilities to live a long and healthy life, to be educated and to enjoy a decent standard of living (UNDP, 1990).

India too has realised the importance of this focus, as reflected in its efforts to promote 'human development' and improve 'the standard of living for the people' by ensuring "a more equitable distribution of development benefits and opportunities, better living environment and empowerment of the poor and marginalised" (Government of India, 2012: 301). Periodic human development reports at the national (Government of India, 2002; Institute of Applied Manpower Research, 2011) as well as state levels to focus public and policy attention on contemporary development issues and advocate pragmatic strategies to address such issues provide evidence of the concern at policy level.[3] In addition, there has also been individual research focused on disparities in economic and human development across states in India (Chaudhuri et al., 2007; Ram and Mohanty, 2005). These attempts have provided useful estimates of disparities in different dimensions of economic and human development. However, with their focus restricted only to the levels of achievement, they have not been able to touch upon distributive issues relating to different human development dimensions.

This paper seeks to fill this gap by estimating both HDI and IHDI across states in India. This is because conceptually the HDI would measure the 'potential' for realising human development when achievements across dimensions are distributed equally among the people, while the IHDI would capture the realised level of human development taking into account inequality in such distributions. The HDI and IHDI would be the same when the distribution of achievement across people in society is equal. The IHDI would fall short of the HDI when there is inequality. It is this shortfall which provides a measure of the loss in potential human development due to inequality. An estimate of the loss can be expressed as a percentage of HDI.

This paper in fact modifies an earlier attempt (Suryanarayana, Agrawal and Prabhu, 2011) to provide estimates of HDIs and IHDIs for the major Indian states. Suryanarayana et al. (2011) estimated the average loss in human development on account of inequality to be 32 per cent in India during 2002–2008. The present work extends that study in two ways. First, an attempt has been made to provide the IHDI estimates for minor states.[4] Second, we contextualise the HDI and, hence, IHDI with reference to domestic goalposts to take into account the feasibility limits defined by the domestic constraints. However, to facilitate an international comparison, we present alternative options with reference to domestic as well as global goalposts.

This study is organised as follows. The next section describes the methodology used in the paper to contextualise the HDI with reference to domestic goalposts. Section 3 discusses the databases. The estimates of HDI, IHDI and their sub-indices are presented in Section 4. The final section concludes.

2 DOMESTIC GOALPOSTS

The UNDP scores corresponding to the three dimensions of human development are worked out with reference to international goalposts to facilitate ranking of countries across the world. Suryanarayana et al. (2011) follow the same procedure to examine the relative ranking of different Indian states in the global context. However, given the focus on domestic feasibility and policy constraints, this study seeks to obtain scores with reference to domestic goalposts, which would provide a realistic assessment of the relative progress of the different states in India. It would also be useful in the light of public concern about uneven distribution of the benefits of growth and, hence, rising inequalities. However, to facilitate assessment of the potential in the global context, this study presents findings with reference to domestic as well as global goalposts.

This section proposes a methodology to work out domestic goalposts for different dimensions of human development to localise HDIs and IHDIs in the Indian context. The domestic goalposts are contextualised with reference to the profile for the **major** Indian states. Instead of using extreme values of different indicators across states, the goalposts are defined with reference to the mainstream of ordered distribution of the indicators. The rationale may be outlined as follows:

Empirical economic issues involve variables, which are largely skewed in distribution. Economists deal even with skewed distributions in terms of mean-based estimators, although these estimators are robust measures only for normal and at best symmetric distributions. For skewed distributions, order-based statistics would provide more robust insights than the mean-based statistics. Hence, we use order-based statistics to define the goalposts.

This study conducts an order-based analysis by using box and whisker plots. We define the mainstream with reference to the central 50 per cent of the ordered distributions as reflected in the inter-quartile range and displayed by the box at the centre of the plot. Consistent with this proposal, the goalposts may be measured in terms of the upper and lower inner fences of the box and whisker plots of the different indicators subject to the caveat that the limits for indictors—say, the combined education index—are set at feasible lower and upper bounds, i.e. zero and one, respectively.[5] These estimates are shown in Table 1.

TABLE 1

Domestic Goalposts for the Human Development Index

Dimension	Upper Inner Fence	Lower Inner Fence
Life expectancy	75.7	50.7
Mean years of schooling	7.19	1.03
Expected years of schooling	10.87	8.18
Combined education index	1.00	0
Per capita income (PPP $)	5772.23	814.68

Source: Authors' estimates.

3 DATA SOURCES

3.1 INCOME

The estimate of Gross National Income (GNI) per capita (PPP US$) for India is taken from the *Human Development Report 2010* (UNDP, 2010). Its distribution across states is worked out as per the distribution profiles of average per capita personal consumption obtained from the National Sample Survey for the year 2004/5 (Government of India, 2006a). This approach would underestimate income inequality, however, since it ignores savings and dis-savings of rich and poor people, respectively. An alternative approach could be to use estimates of state domestic product (SDP). However, it has a major limitation that it refers only to income generated; it does not include inter-state/national remittances and actual income distribution; in addition, some of its components are based on intra/extrapolations.

Consistent with the profile on income distribution across states, estimates of intra-state personal income inequality (Atkinson's inequality indices) are estimated using the National Sample Survey unit record data on personal consumption distribution for the year 2004/5. Such consumption inequality estimates are generated after truncating the top 0.5-percentile of the distribution and replacing zero expenditure with minimum value of expenditure of the bottom 0.5-percentile group, as UNDP does (2010).[6]

3.2 EDUCATION

The dimension index on education is based on (i) mean years of schooling; and (ii) expected years of schooling (school life expectancy). Mean years of schooling of the adult population (aged 25 years and above) are estimated using the unit-level information from the National Sample Survey data on 'Educational Status and Training in India' (Government of India, 2006c). The same data source is used to estimate Atkinson inequality indices in levels of education. To overcome computational problems in estimating inequality when there are observations with zero years of schooling, following UNDP (2010), one is added to all valid observations on years of schooling. Estimates of expected years of schooling are made based on the National Sample Survey on Education in India (Government of India, 2010).

3.3 HEALTH

Estimates of life expectancy for 16 major states are obtained from *SRS Based Abridged Life Tables 2002–2006* (Government of India, 2008). Estimates of life expectancy for the three states formed in 2000—Chhattisgarh, Jharkhand and Uttarakhand—and the state of Jammu and Kashmir are obtained from the *Population Projections for India and States 2001–2026* (Government of India, 2006b).[7] The same report also provides estimates of life expectancy for the seven states of northeast India (i.e. excluding Assam), and the same has been used as a proxy for all seven states.

The data sources for estimating inequality (Atkinson's index) in life expectancy are the tables on life expectancy across age intervals for the Indian states (Government of India, 2008).[8] Since the tables are available only for 16 major states, the inequality index could only be computed for them. The inequality index for Chhattisgarh, Jharkhand and Uttarakhand is assumed as the same as that of their respective parent state; for the seven states in northeast India it is proxied by that of Assam; and for the state of Jammu and Kashmir we have assumed it to be same as that of West Bengal.[9]

4 ESTIMATES AND FINDINGS

The discussion in this section begins with findings based on estimates of HDI and IHDI with reference to international goalposts. We discuss the estimates with domestic goalposts in Section 4.2. Table 2 summarises the information on basic indicators.

TABLE 2

Key Indicators: States and All-India

State	PPP income per capita (PPP 2008 $)	Life expectancy at birth (years) (2002–2006)	Mean years of schooling (years) (2004/05)	School life expectancy (years) (2007/08)
Andhra Pradesh	3398.76	64.40	3.06	9.66
Arunachal Pradesh	3827.03	68.54	3.56	10.69
Assam	2883.44	58.90	3.96	9.54
Bihar	2161.80	61.60	2.97	9.58
Chhattisgarh	2497.00	60.24	3.39	9.31
Gujarat	3782.87	64.10	4.54	8.79
Haryana	4574.51	66.20	4.74	9.68
Himachal Pradesh	4168.39	67.00	4.88	11.05
Jammu & Kashmir	4211.40	63.84	4.07	10.54
Jharkhand	2516.41	63.03	3.32	9.68
Karnataka	3269.76	65.30	3.95	9.75
Kerala	5262.89	74.00	6.19	11.33
Madhya Pradesh	2673.76	58.00	3.47	8.95
Maharashtra	3913.14	67.20	5.12	9.86
Manipur	3131.51	68.54	5.75	10.37
Meghalaya	3545.56	68.54	4.47	10.20
Mizoram	4612.06	68.54	6.04	10.06
Nagaland	5632.43	68.54	6.75	10.55
Orissa	2185.84	59.60	3.34	8.74
Punjab	4885.12	69.40	5.12	9.80
Rajasthan	3289.27	62.00	2.96	9.19
Sikkim	3591.16	68.54	4.17	10.08
Tamil Nadu	3835.05	66.20	4.79	10.57
Tripura	2731.16	68.54	4.14	9.38
Uttar Pradesh	2910.58	60.00	3.56	9.19
Uttarakhand	3536.13	63.96	4.97	10.23
West Bengal	3414.08	64.90	4.36	8.87
India	**3337.00**	**63.50**	**4.10**	**9.62**

Source: See text.

4.1 HDIS BASED ON GLOBAL GOALPOSTS

Table 3 provides relevant information on estimates of sub-indices and the inequality-adjusted sub-indices for the three different human development dimensions with reference to international goalposts.

TABLE 3

Estimates of Sub-indices by Dimension, With and Without Adjustment for Inequality: International Goalposts

State	Income (x)			Education (y)			Health (z)		
	I_x	I_{Ix}	Loss	I_y	I_{Iy}	Loss	I_z	I_{Iz}	Loss
Andhra Pradesh	0.467	0.397	15.16	0.347	0.192	44.60	0.703	0.479	31.75
Arunachal Pradesh	0.486	0.433	10.86	0.393	0.220	44.12	0.768	0.473	38.39
Assam	0.442	0.404	8.58	0.392	0.258	34.21	0.616	0.379	38.39
Bihar	0.398	0.364	8.50	0.340	0.187	45.03	0.658	0.411	37.63
Chhattisgarh	0.420	0.356	15.33	0.358	0.202	43.56	0.637	0.363	42.91
Gujarat	0.484	0.413	14.64	0.403	0.243	39.70	0.698	0.475	31.91
Haryana	0.513	0.445	13.25	0.432	0.244	43.39	0.731	0.485	33.63
Himachal Pradesh	0.499	0.433	13.22	0.468	0.287	38.80	0.744	0.527	29.17
Jammu & Kashmir	0.500	0.454	9.35	0.418	0.233	44.16	0.694	0.482	30.48
Jharkhand	0.421	0.363	13.72	0.361	0.196	45.75	0.681	0.425	37.63
Karnataka	0.461	0.387	16.17	0.396	0.226	42.85	0.717	0.503	29.76
Kerala	0.535	0.449	16.07	0.534	0.410	23.25	0.854	0.764	10.54
Madhya Pradesh	0.430	0.365	15.10	0.355	0.194	45.24	0.601	0.343	42.91
Maharashtra	0.489	0.398	18.69	0.453	0.279	38.38	0.747	0.562	24.73
Manipur	0.455	0.435	4.39	0.492	0.310	37.00	0.768	0.473	38.39
Meghalaya	0.474	0.442	6.68	0.431	0.305	29.13	0.768	0.473	38.39
Mizoram	0.514	0.467	9.22	0.497	0.413	16.99	0.768	0.473	38.39
Nagaland	0.545	0.495	9.16	0.538	0.373	30.69	0.768	0.473	38.39
Orissa	0.399	0.341	14.71	0.345	0.199	42.18	0.627	0.380	39.31
Punjab	0.523	0.455	13.05	0.452	0.265	41.40	0.782	0.572	26.86
Rajasthan	0.462	0.409	11.53	0.333	0.179	46.07	0.665	0.400	39.79
Sikkim	0.476	0.422	11.28	0.413	0.265	35.92	0.768	0.473	38.39
Tamil Nadu	0.486	0.405	16.72	0.454	0.278	38.66	0.731	0.550	24.70
Tripura	0.434	0.386	10.95	0.397	0.252	36.61	0.768	0.473	38.39
Uttar Pradesh	0.444	0.384	13.35	0.365	0.195	46.48	0.633	0.384	39.33
Uttarakhand	0.473	0.417	12.03	0.454	0.256	43.71	0.696	0.422	39.33
West Bengal	0.468	0.396	15.44	0.397	0.238	39.89	0.710	0.494	30.48
India	**0.465**	**0.389**	**16.37**	**0.400**	**0.229**	**42.80**	**0.688**	**0.452**	**34.29**

Source: Authors' estimates.

Note: The symbol I_j denotes the dimension index for *j*th dimension, and I_{Ij} the corresponding inequality-adjusted index.

The estimates of HDI and IHDI are shown in Table 4 and are plotted in Maps 1, 2, and 3. Distribution of the global HDI across the states is shown in Figure 1.

TABLE 4

Estimates of Global HDI and Global IHDI across States

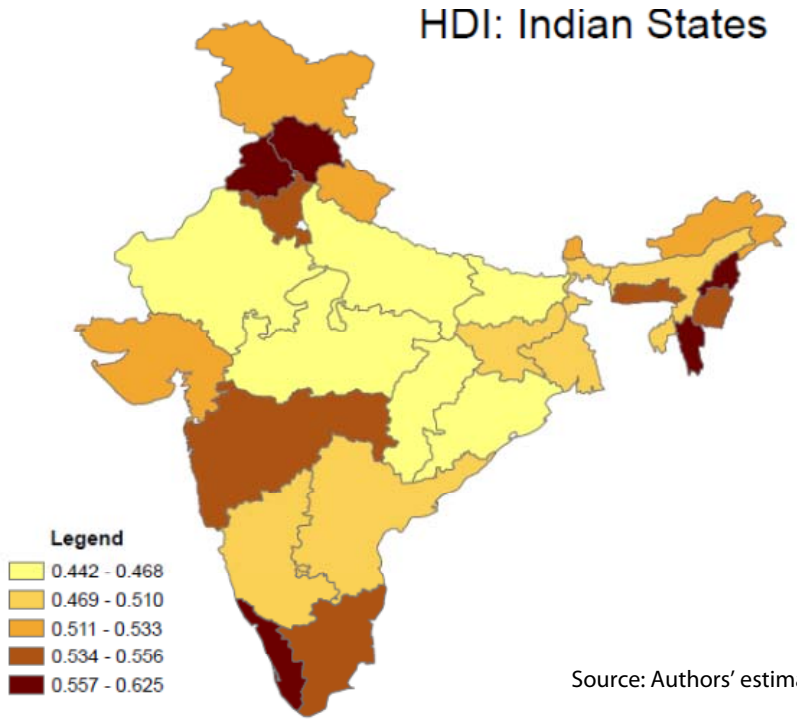
State	HDI	IHDI	Ratio	Loss (%)	Rank HDI	Rank IHDI	Difference
Andhra Pradesh	0.485	0.332	0.685	31.55	19	20	-1
Arunachal Pradesh	0.527	0.356	0.675	32.55	13	16	-3
Assam	0.474	0.341	0.718	28.17	20	19	1
Bihar	0.447	0.303	0.679	32.05	26	24	2
Chhattisgarh	0.458	0.297	0.649	35.14	24	25	-1
Gujarat	0.514	0.363	0.705	29.50	15	13	2
Haryana	0.545	0.375	0.688	31.18	8	11	-3
Himachal Pradesh	0.558	0.403	0.722	27.81	5	5	0
Jammu & Kashmir	0.525	0.371	0.706	29.40	14	12	2
Jharkhand	0.470	0.312	0.663	33.66	21	21	0
Karnataka	0.508	0.353	0.696	30.44	18	18	0
Kerala	0.625	0.520	0.832	16.78	1	1	0
Madhya Pradesh	0.451	0.290	0.643	35.73	25	27	-2
Maharashtra	0.549	0.397	0.722	27.75	7	8	-1
Manipur	0.556	0.400	0.719	28.14	6	7	-1
Meghalaya	0.539	0.400	0.741	25.86	10	6	4
Mizoram	0.581	0.450	0.774	22.57	3	2	1
Nagaland	0.609	0.444	0.729	27.07	2	3	-1
Orissa	0.442	0.296	0.669	33.11	27	26	1
Punjab	0.569	0.410	0.720	28.03	4	4	0
Rajasthan	0.468	0.308	0.660	34.02	23	22	1
Sikkim	0.533	0.375	0.705	29.51	11	10	1
Tamil Nadu	0.544	0.396	0.727	27.27	9	9	0
Tripura	0.510	0.358	0.703	29.68	16	15	1
Uttar Pradesh	0.468	0.307	0.655	34.47	22	23	-1
Uttarakhand	0.531	0.356	0.670	33.03	12	17	-5
West Bengal	0.509	0.360	0.707	29.30	17	14	3
India	**0.504**	**0.343**	**0.680**	**32.01**			

Source: Authors' estimates.

Note: 'Difference' denotes the difference between the 'Rank HDI' and 'Rank IHDI' above and, therefore, denotes the gain or loss in ranking due to inequality-adjustment.

MAP 1

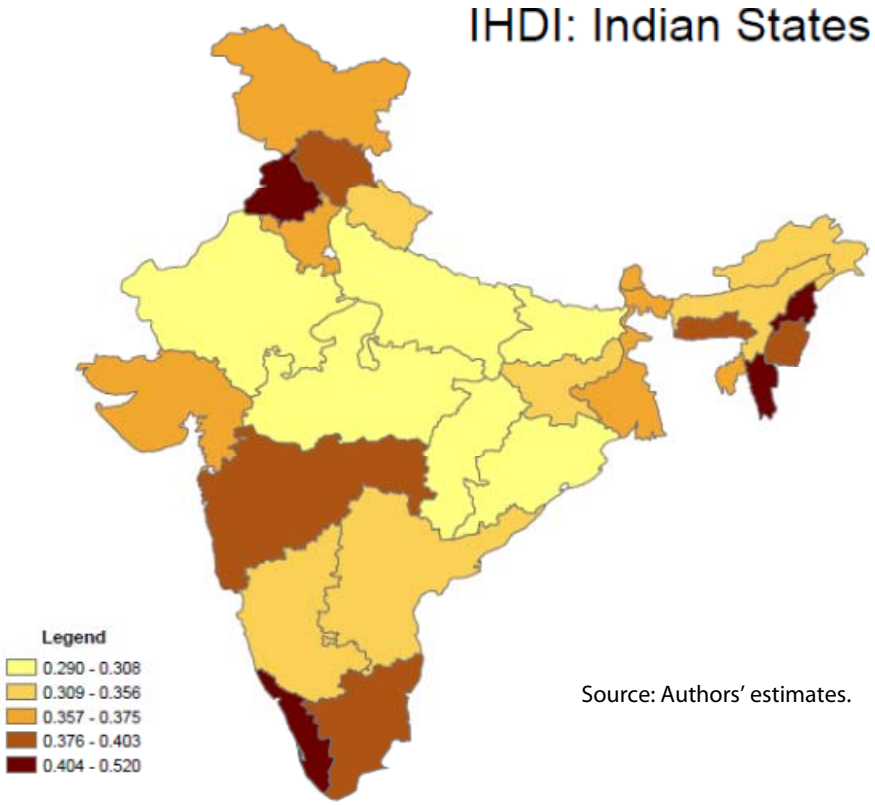
HDI across Indian States (International Goalposts)



Source: Authors' estimates.

MAP 2

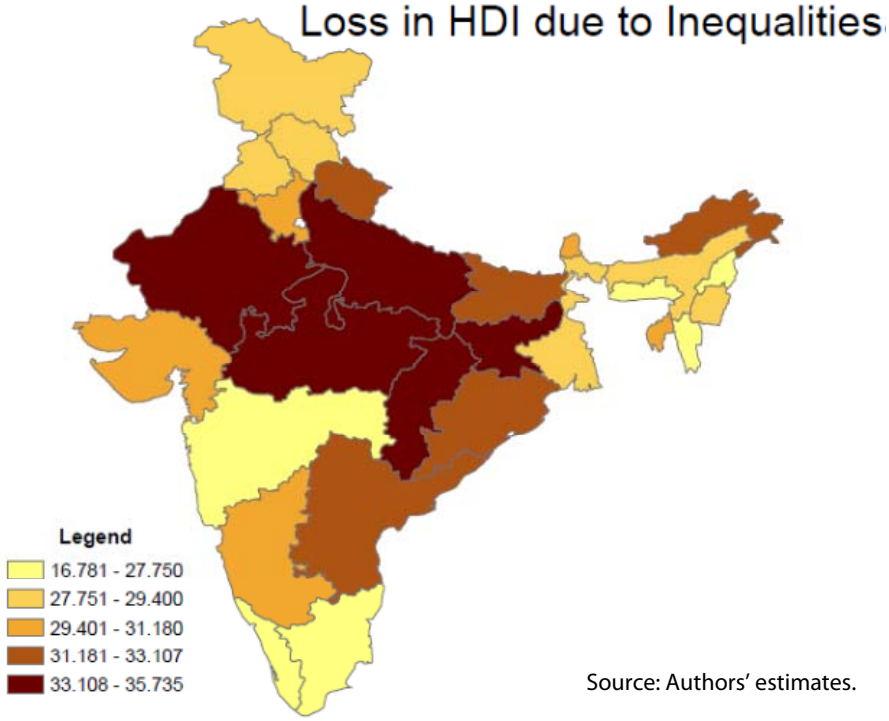
IHDI across Indian States (International Goalposts)



Source: Authors' estimates.

MAP 3

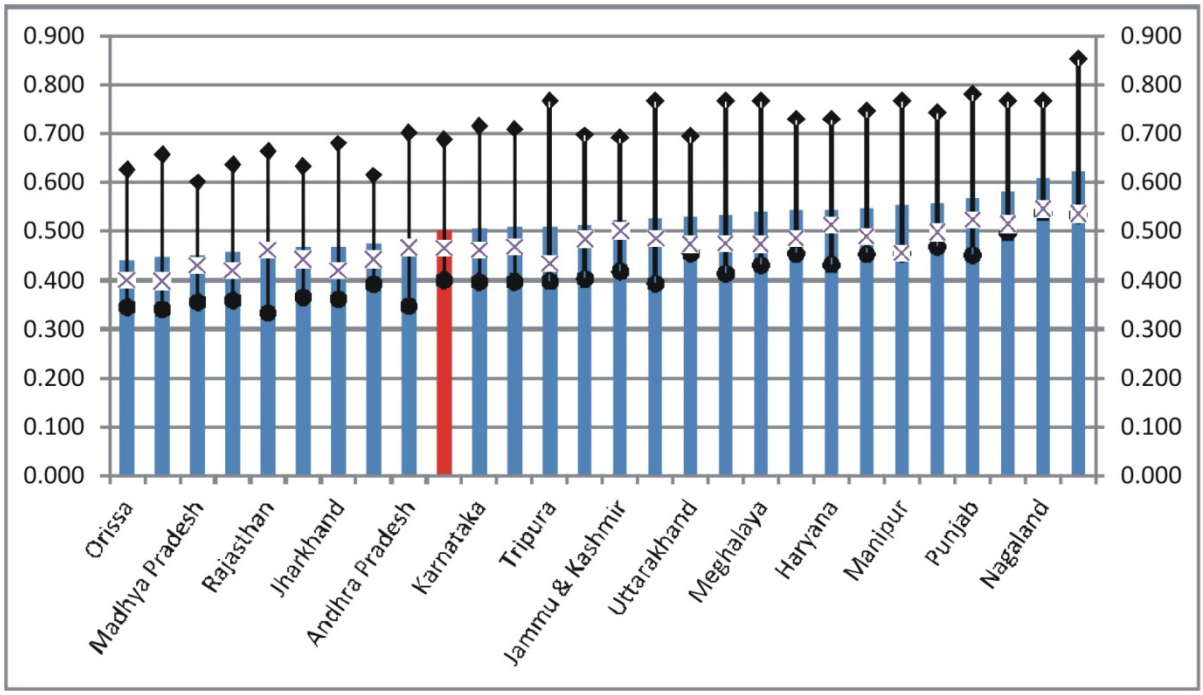
Loss in HDI due to Inequalities



Source: Authors' estimates.

FIGURE 1

HDI and its Dimensions: Indian States (International Goalposts)



Notes: *i)*Vertical bars (blue in colour for the states and red for India) indicate the HDI; dark black circles (which happen to be inside the bars) are the education dimension index; crosses within white squares are the income dimension index; and dark black diamonds (which happen to lie outside the bars) are the health dimension index and
ii) The states are arranged in ascending order of HDI.

Source: Authors' estimates.

The main findings are as follows:

4.1.1 India's human development status in the global context

1. Indian achievement in terms of the normalised HDI with reference to the international goalposts is 0.504. The country falls short of the world average, which is 0.624 (UNDP, 2010: 155). India belongs to the category of countries with 'medium human development'.
2. HDI is the highest for Kerala (0.625), followed by Nagaland (0.609) and Mizoram (0.581), and the lowest for Orissa (0.442), Bihar (0.447) and Madhya Pradesh (0.451). Kerala and the seven northeastern states barring Assam, Punjab, Himachal Pradesh, Haryana, Maharashtra, Tamil Nadu, Karnataka, Gujarat, West Bengal and Uttarakhand fall under the 'medium HDI' category. The other nine states are 'low HDI'.
3. According to our estimates, India's rank on the global HDI is 120th; those of the different states range from 99th for the state of Kerala (whose global HDI estimate places it between Botswana and the Republic of Moldova) to 133rd for Orissa (whose global HDI estimate places it between Myanmar and Yemen).
4. The average loss due to inequality is 32 per cent at the all-India level. It is the highest for Madhya Pradesh (36 per cent) and Chhattisgarh (35 per cent) and the lowest for Kerala (17 per cent). The loss due to inequality is higher than the national average in the states of Madhya Pradesh, Chhattisgarh, Uttar Pradesh, Rajasthan, Jharkhand, Orissa, Uttarakhand and Arunachal Pradesh. These are the states which need serious attention in promoting access to education and health facilities to reduce inequalities in these dimensions and reduce the loss in human development.
5. Assam, Bihar, Gujarat, Jammu and Kashmir, Meghalaya, Mizoram, Orissa, Rajasthan, Sikkim, Tripura and West Bengal improve their ranking after adjustment for inequality, while the rankings worsen for Andhra Pradesh, Arunachal Pradesh, Chhattisgarh, Haryana, Madhya Pradesh, Maharashtra, Manipur, Nagaland, Uttarakhand and Uttar Pradesh. This means that the former sub-set of states are doing relatively better with reference to the inequality dimension on human development.

4.1.2 Income

1. Income indicates the opportunities dimension of human well-being. Sixteen out of the 27 states fare as well as or better than the nation as a whole in terms of sub-index for the income dimension (0.465).
2. The average loss because of inequality in income is 16 per cent at the all-India level; it is highest for Maharashtra (19 per cent), followed by Tamil Nadu (17 per cent), and lowest for Manipur (4 per cent). Maharashtra, which ranks eighth in the country based on the income dimension index (Table 3), ranks 17th after the adjustment for income inequality.

4.1.3 Education

1. All the states except the economically poorer states of Bihar, Madhya Pradesh, Rajasthan, Orissa and Uttar Pradesh (including the newly carved states of Chhattisgarh, Jharkhand and Uttarakhand) and Assam and Arunachal Pradesh fare as well as or better than the nation as a whole in terms of sub-index for the education dimension.
2. The loss in the education component on account of inequality at the all-India level is 43 per cent. The loss is highest in Uttar Pradesh, Rajasthan and Jharkhand (46 per cent) and lowest in Mizoram (17 per cent) and Kerala (23 per cent).
3. The loss due to inequality is more than that at the national level in Karnataka, Haryana, Chhattisgarh, Uttarakhand, Arunachal Pradesh, Jammu and Kashmir, Andhra Pradesh, Bihar, Madhya Pradesh, Jharkhand, Rajasthan and Uttar Pradesh.

4.1.4 Health

1. Kerala (0.854) ranks first, followed by Punjab (0.782) and the seven northeastern states (0.768 each); Madhya Pradesh (0.601) and Assam (0.616) are last in terms of the sub-index for health.
2. The average loss due to inequality in health is 34 per cent. It is highest in Chhattisgarh and Madhya Pradesh (43 per cent) and lowest in Kerala (11 per cent).

A comparison of the three dimensions of the HDI indicates that the country's achievement in terms of the normalised indices, both with and without inequality adjustment, is better with respect to health than for the HDI as a whole, and this is the case for most of the states (Figure 1).

The loss due to inequality is highest with respect to education (43 per cent), followed by health (34 per cent) and income (16 per cent). In other words, the potential lost due to inequality is highest in the education sector. The rank correlation with HDI across states is highest for income, followed by education and health (Suryanarayana et al., 2011). Further, the rank correlations between different pairs of normalised indices are positive and significant, implying that achievement or deprivation in different dimensions co-vary across states.

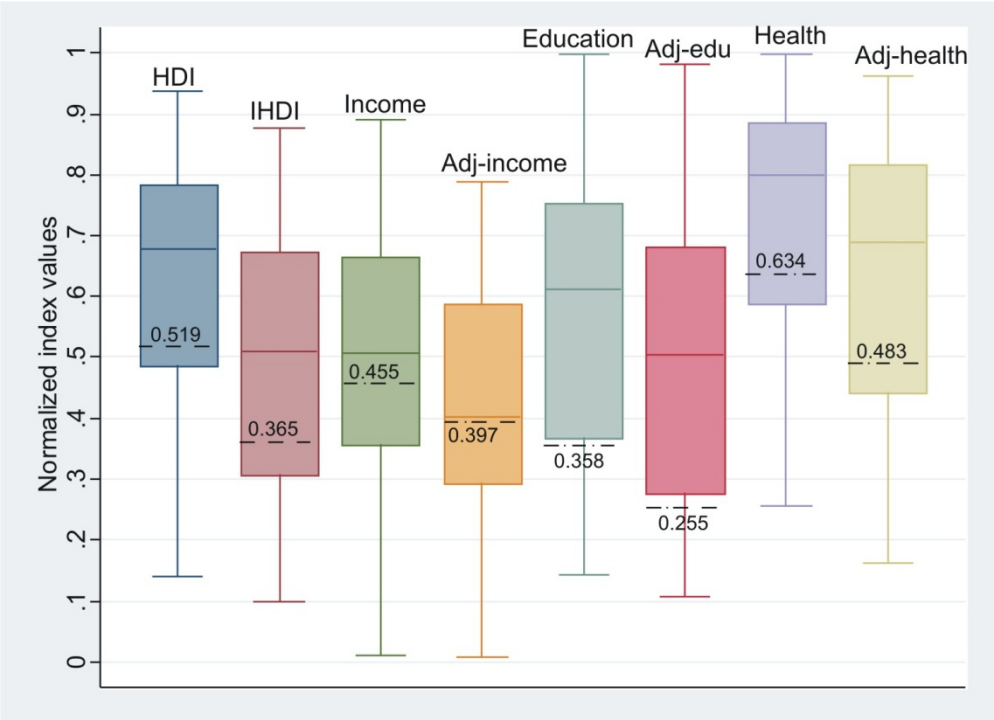
In comparison with countries across the world, there are marked differences in the distribution of human development outcomes in India (Suryanarayana et al., 2011). The box plot profiles for global HDI and IHDI for the Indian states vis-à-vis countries across the world indicate that while the upper quartile for IHDI is about the median for HDI across countries, even the upper extreme value for IHDI falls just short of the median for HDI across Indian states. Thus, inequality in the distribution of human development is distinctly pronounced in India in comparison with the world scenario.

Similarly, while the plots for normalised indices across dimensions bring out a progressive increase in the median from income to education and to health across countries, the order is from education to income and finally to health across the Indian states. In other words, education requires serious policy attention to reduce disparities in attainment. While India lies in the inter-quartile range of cross-country distribution for income, health and the HDI (and their inequality-adjusted indices), it is not the case with education, for which the country

stands among the bottom 25 per cent of countries in the world (Figure 2). The extent of inequality in human development in India is such that while the adjustment for inequality made little difference to the distributional profile of normalised indices for education across countries, the same brought about a radical downward shift of the box plot for the Indian states. Accordingly, the loss due to inequality in education is 43 per cent for India but much less (28 per cent) in the world as a whole; the loss due to inequality in health is 34 per cent, compared to the world average of 21 per cent (UNDP, 2010: 155).

FIGURE 2

Distribution of HDI and its Dimensions: Countries (International Goalposts)



Source: Based on estimates from UNDP (2010).

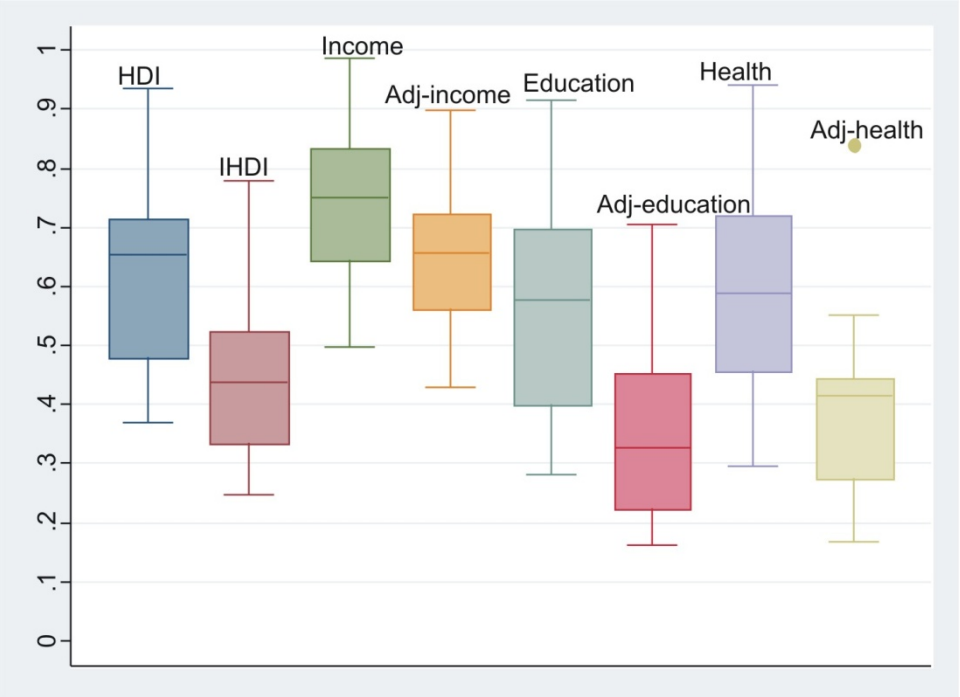
Note: The dashed lines and the values indicated for each plot correspond to the value of index for India.

4.2 HDIS BASED ON DOMESTIC GOALPOSTS

The normalised indices for different dimensions of human development with respect to the domestic goalposts, as one would expect, throw up a profile very similar to the one based on the global goalposts (Figure 3).[10] Since the change in goalposts does not affect the inequality-adjustment factor, the profiles of loss would remain unchanged.

FIGURE 3

Profiles of HDI, IHDI and their Dimensions: Indian States (Domestic Goalposts)



Source: Authors' estimates.

Notes: The dotted observation in cases of inequality-adjusted sub-index for health represents Kerala, which is an outlier among Indian states.

Table 5 provides information on estimates of sub-indices and the inequality-adjusted sub-indices for the three different human development dimensions. The estimates of HDI and IHDI are shown in Table 6. The main findings are summarised below:

4.2.1 Aggregate HDI

1. The average achievement at the all-India level with reference to the domestic goalposts is 0.576.
2. The profile of ranks across states is slightly different from the one observed for the profile based on international goalposts.

4.2.2 Income

1. Nagaland (0.987) ranks first in terms of this index, followed by Kerala (0.953) and Punjab (0.915); the lowest ranked are Bihar (0.498) and Orissa (0.504).
2. Remaining features remain unchanged.

4.2.3 Education

1. The education index is highest for Kerala (0.915), followed by Nagaland (0.905) and Himachal Pradesh (0.790), and lowest for Orissa (0.281) and Madhya Pradesh (0.337).

4.2.4 Health

2. Kerala (0.940) ranks first and Madhya Pradesh last (0.294) in terms of the sub-index for health.

TABLE 5

Estimates of Sub-indices by Dimension, With and Without Adjustment for Inequality: Domestic Goalposts

State	Income (x)			Education (y)			Health (z)		
	I_x	I_{Ix}	Loss	I_y	I_{Iy}	Loss	I_z	I_{Iz}	Loss
Andhra Pradesh	0.729	0.619	15.16	0.426	0.236	44.60	0.552	0.377	31.75
Arunachal Pradesh	0.790	0.704	10.86	0.618	0.345	44.12	0.719	0.443	38.39
Assam	0.645	0.590	8.58	0.490	0.323	34.21	0.331	0.204	38.39
Bihar	0.498	0.456	8.50	0.404	0.222	45.03	0.440	0.274	37.63
Chhattisgarh	0.572	0.484	15.33	0.401	0.226	43.56	0.385	0.220	42.91
Gujarat	0.784	0.669	14.64	0.359	0.217	39.70	0.540	0.368	31.91
Haryana	0.881	0.764	13.25	0.578	0.327	43.39	0.625	0.415	33.63
Himachal Pradesh	0.834	0.723	13.22	0.790	0.484	38.80	0.657	0.466	29.17
Jammu & Kashmir	0.839	0.760	9.35	0.657	0.367	44.16	0.530	0.368	30.48
Jharkhand	0.576	0.497	13.72	0.455	0.247	45.75	0.497	0.310	37.63
Karnataka	0.710	0.595	16.17	0.526	0.301	42.85	0.589	0.414	29.76
Kerala	0.953	0.800	16.07	0.915	0.703	23.25	0.940	0.840	10.54
Madhya Pradesh	0.607	0.515	15.10	0.337	0.184	45.24	0.294	0.168	42.91
Maharashtra	0.801	0.652	18.69	0.644	0.397	38.38	0.665	0.501	24.73
Manipur	0.688	0.657	4.39	0.789	0.497	37.00	0.719	0.443	38.39
Meghalaya	0.751	0.701	6.68	0.648	0.459	29.13	0.719	0.443	38.39
Mizoram	0.885	0.804	9.22	0.754	0.626	16.99	0.719	0.443	38.39
Nagaland	0.987	0.897	9.16	0.905	0.627	30.69	0.719	0.443	38.39
Orissa	0.504	0.430	14.71	0.281	0.162	42.18	0.359	0.218	39.31
Punjab	0.915	0.795	13.05	0.632	0.370	41.40	0.754	0.552	26.86
Rajasthan	0.713	0.630	11.53	0.343	0.185	46.07	0.456	0.274	39.79
Sikkim	0.758	0.672	11.28	0.600	0.384	35.92	0.719	0.443	38.39
Tamil Nadu	0.791	0.659	16.72	0.735	0.451	38.66	0.625	0.471	24.70
Tripura	0.618	0.550	10.95	0.475	0.301	36.61	0.719	0.443	38.39
Uttar Pradesh	0.650	0.563	13.35	0.393	0.210	46.48	0.375	0.227	39.33
Uttarakhand	0.750	0.659	12.03	0.697	0.392	43.71	0.535	0.324	39.33
West Bengal	0.732	0.619	15.44	0.373	0.224	39.89	0.573	0.398	30.48
India	**0.720**	**0.602**	**16.37**	**0.515**	**0.295**	**42.80**	**0.516**	**0.339**	**34.29**

Source: Authors' estimates.

Note: Please see note to Table 3.

TABLE 6

Estimates of HDI and IHDI across States: Domestic Goalposts

State	HDI	IHDI	Ratio	Loss (%)	Rank HDI	Rank IHDI	Difference
Andhra Pradesh	0.556	0.381	0.685	31.55	17	18	-1
Arunachal Pradesh	0.706	0.476	0.675	32.55	8	11	-3
Assam	0.471	0.338	0.718	28.17	22	20	2
Bihar	0.446	0.303	0.679	32.05	24	23	1
Chhattisgarh	0.445	0.289	0.649	35.14	25	25	0
Gujarat	0.534	0.376	0.705	29.50	19	19	0
Haryana	0.683	0.470	0.688	31.18	12	12	0
Himachal Pradesh	0.757	0.546	0.722	27.81	5	4	1
Jammu & Kashmir	0.664	0.468	0.706	29.40	13	13	0
Jharkhand	0.507	0.336	0.663	33.66	20	21	-1
Karnataka	0.604	0.420	0.696	30.44	15	15	0
Kerala	0.936	0.779	0.832	16.78	1	1	0
Madhya Pradesh	0.392	0.252	0.643	35.73	26	26	0
Maharashtra	0.700	0.506	0.722	27.75	10	9	1
Manipur	0.731	0.525	0.719	28.14	6	6	0
Meghalaya	0.705	0.522	0.741	25.86	9	7	2
Mizoram	0.783	0.606	0.774	22.57	3	3	0
Nagaland	0.863	0.629	0.729	27.07	2	2	0
Orissa	0.370	0.248	0.669	33.11	27	27	0
Punjab	0.758	0.546	0.720	28.03	4	5	-1
Rajasthan	0.481	0.317	0.660	34.02	21	22	-1
Sikkim	0.689	0.486	0.705	29.51	11	10	1
Tamil Nadu	0.714	0.519	0.727	27.27	7	8	-1
Tripura	0.595	0.419	0.703	29.68	16	16	0
Uttar Pradesh	0.458	0.300	0.655	34.47	23	24	-1
Uttarakhand	0.654	0.438	0.670	33.03	14	14	0
West Bengal	0.539	0.381	0.707	29.30	18	17	1
India	**0.576**	**0.392**	**0.680**	**32.01**			

Source: Authors' estimates.

Note: Please see note to Table 4.

The results obtained from domestic goalposts differ from those from the global ones in some respects and tally with them in others. They are different in that India's achievement is better with respect to income dimension than for the HDI as a whole—both with and without inequality adjustment. They tally with the global estimates in that the pair-wise rank correlations between the scores on different dimensions are positive and significant, implying that achievement or deprivation in different dimensions co-vary across states (Table 7).

TABLE 7

Correlation between Ranks Based on Different Pairs of HDI and their Sub-indices (Domestic Goalposts)

	HDI	IHDI	I_x	I_{Ix}	I_y	I_{Iy}	I_z	I_{Iz}
HDI	1							
IHDI	0.992*	1						
I_x	0.852*	0.842*	1					
I_{Ix}	0.875*	0.867*	0.959*	1				
I_y	0.907*	0.917*	0.708*	0.748*	1			
I_{Iy}	0.923*	0.943*	0.714*	0.757*	0.979*	1		
I_z	0.898*	0.892*	0.692*	0.726*	0.714*	0.775*	1	
I_{Iz}	0.908*	0.903*	0.742*	0.698*	0.753*	0.791*	0.930*	1

Source: Authors' estimates.

Notes: Please see notes to Table 3.

* Indicates statistically significant correlation at the 5 per cent level.

The relative ranking of each state under review could be examined in terms of inequality-adjusted and unadjusted scores for the three dimensions as well as aggregate, which throws up eight different inter-state quartile-group profiles. Tabulations based on estimates in Tables 5 and 6 highlight the following features:

- Kerala is the only state in the country which remains in the 'very high HDI' with respect to all the dimensions, both with and without adjustment for inequality. In addition, Nagaland, Mizoram and Punjab fare well by most of the indicators, with and without the adjustment for inequality.
- BIMARU states[11] (including the three states formed in 2000) and Assam generally belong to the 'low HDI' group by almost all the indicators, but this is not the case for other regions of the country. For instance, the four southern states, known for better levels of human development than the rest of the country, throw up a heterogeneous profile, with Andhra Pradesh and Karnataka 'medium HDI', Tamil Nadu mostly 'high HDI' and Kerala 'very high HDI'. The profile for northeastern India is similar: the majority of the scores for Manipur, Mizoram and Nagaland classify them as 'high and very high HDI', whereas Tripura lags behind with 'low and medium HDI'. The rest of the northeastern states fall under 'high HDI'.

5 CONCLUDING REMARKS

This study provides estimates of HDI and IHDI for the Indian states with reference to goalposts specified in the domestic as well as global contexts. While the global goalposts are adopted from the UNDP specification (UNDP, 2010), the domestic ones are worked out taking into account a local feasibility dimension. Towards this end, the study has proposed an alternative mechanism to arrive at the local goalposts for the three dimensions of HDI. The goalposts are specified with reference to the mainstream as given by the central 50 per cent of the ordered distribution. In other words, the upper and lower inner fences of the box and whisker plots of the different indicators are taken as goalposts. Of course, this is subject to the caveat that the limits for indicators — say, the combined education index —are set at feasible lower and upper bounds, i.e. zero and one, respectively. The goalposts thus arrived at are robust feasible extremes.

The IHDI estimates facilitate quantification of the potential lost due to inequality with respect to the different dimensions and, hence, help explain uneven human development attainments across the Indian states. The findings show substantial loss in human development due to inequality in different dimensions across states. The potential lost due to inequalities is higher in education than in the other two dimensions. The fact that the inequalities in the education dimension are the highest matches the findings in the global context reported in the UNDP *Human Development Report 2010*, which calls for a focus specifically on areas and social groups that continue to have constraints in accessing education. Similarly, the inequalities are staggering in the case of health. Many studies have pointed out marked differences in access to health care and its utilisation. In both education and health, not only is the level of attainment low, but the extent of inequality is also high. Given the spectacular growth that the country has witnessed in the last decade, the policies promoting economic growth need to be integrated with the distributional dimensions of education and health.

In sum, the findings of the study provide useful policy insights calling for a strategy to promote human development through a distributive policy option that addresses inequalities across dimensions in different states in the country.

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NOTES

1. The level of human development has been low in the country ever since the planning process began, and this problem is compounded by skewed distribution across states (Sen, 1989; 1998).

2. The Government of India's concern about rising inequalities and uneven distribution of the benefits of growth was reflected in the XI Five Year Plan (2007–12), which focused on 'inclusive growth'. The XII Five Year Plan deepens and sharpens the focus on inequalities. While preparing the Approach Paper for the XII Plan, the Planning Commission for the first time set up a dedicated web portal to involve interested stakeholders. The Commission has identified 12 strategy challenges to initiate the consultations on some core areas— many of which target inclusive development.

3. It may, however, be noted that the two national HDRs for the country are based on the methodology used in earlier HDRs by the United Nations. Hence, the HDIs and the ranks in this study— which uses UNDP (2010) methodology— may not be comparable with those in the national HDRs.

4. This study covers 27 of the 28 states in the country. The HDI and IHDI for the state of Goa could not be estimated, because reliable information on the health dimension were not available.

5. Lower and upper inner fences are defined with reference to the upper and lower hinges of the box (quartiles of the distribution). The difference between the two hinges is called the H-spread, and 1.5 times the H-spread constitutes a step. The upper inner fence is given by one step beyond the upper hinge, while lower inner fence is given by one step beyond the lower hinge (Thompson, 2011).

6. The *HDR 2010* uses different data sources such as household assets, consumption and income for different countries to estimate inequality in income. For India, it estimates inequality from imputed income using an assets index methodology (UNDP, 2010).

7. The estimates of life expectancy for the three parent states in Government of India (2008) include the new states.

8. Please see Kovacevic (2010) for a detailed methodology on deriving the Atkinson's inequality index for the distribution of expected age at death.

9. We have to rely on these proxies because the life tables are only available for 16 major states. The other demographic indicator that could have some bearing on the sub-index for health dimension and is available for the rest of the states is infant mortality. We use this information and choose a state that is closest to Jammu and Kashmir in terms of life expectancy and infant mortality. By this criterion, we find West Bengal closest to Jammu and Kashmir and use the inequality index of the former as a proxy for the latter. The same procedure could be used for the seven states in northeast India, if the information on life expectancy for each of them had been available.

10. Estimates of Spearman rank correlations between the two sets of indices based on alternative goalposts are positive and statistically significant, which corroborates this observation.

11. Bihar, Madhya Pradesh, Rajasthan and Uttar Pradesh.

International Policy Centre for Inclusive Growth (IPC - IG)
Poverty Practice, Bureau for Development Policy, UNDP
Esplanada dos Ministérios, Bloco O, 7º andar
70052-900 Brasilia, DF - Brazil
Telephone: +55 61 2105 5000

E-mail: ipc@ipc-undp.org ▪ URL: www.ipc-undp.org