Regional Patterns of Human and Child Deprivation in India

JEAN DREVÉ, REETIKA KHERA

This paper takes a look at regional patterns of human and child deprivation in India, based on district-level data. It presents and compares two simple summary indices of living conditions at the district level: a standard “human development index” and a variant of it focusing specifically on children.

Introduction

More than 20 years have passed since the Human Development Index (HDI) was devised, in the context of the first Human Development Report (UNDP 1990). The initial index was an informal aggregate of three specific indicators: life expectancy, adult literacy and per capita income. There is, clearly, an element of arbitrariness in the selection of these indicators, as well as in the aggregation formula. Nevertheless, the HDI served some useful communication purposes: it produced a rough “ranking” of countries based on human development indicators that do capture important aspects of the quality of life, and this (along with other key messages of the Human Development Reports) helped to bring human development closer to the centre of attention in development economics and public policy.

Since then, many variants of the initial HDI have been devised, and the computation of HDI-type indexes (including creative offshoots such as the “Happy Planet Index”) has become an absorbing research activity. The limitations of these indexes are sometimes overlooked in this rush for unidimensional quantitative indicators of social progress. Some of them, however, have served useful purposes. In India, for instance, the computation of state-specific HDIs and related indicators (including the recent “multidimensional poverty index”) has contributed to a better understanding of regional disparities in human development.

This paper takes a closer look at regional patterns of human and child deprivation in India, based on district-level data. We present and compare two simple summary indexes of living conditions at the district level: a standard “human development index”, and a variant of it focusing specifically on children. The component indicators are also discussed.

Unless stated otherwise, all the indicators presented in this paper refer to rural and urban areas combined. Due to data limitations, the north-eastern region (including Assam) is omitted from district-level analyses, as is the state of Jammu and Kashmir. For the same reason, the reference period (unless otherwise specified) is 2001, or the closest subsequent year for which the relevant data are available. Hopefully, similar work on more recent data, including the 2011 Census, will soon be possible.

1 A District-Specific HDI

We begin by presenting a simple HDI for Indian districts, subject to the qualifications mentioned earlier. This index is based on three indicators, similar to those that initially made up the UNDP’s
Human Development Index: adult female literacy, child mortality, and the proportion of households with a “low standard of living”. Literacy rates are available from the Census of India 2001. Estimates of district-specific child mortality rates (more precisely “Q5”, the probability of dying before age five) for 2001, also based on census data, are available from the Population Foundation of India (Rajan et al 2008). The third indicator available from the second District Level Household Survey (DLHS-2), conducted in 2002-04 (International Institute for Population Sciences 2006a). There are significant margins of error in the individual district estimates for the last two indicators, and the main focus here is on broad regional patterns rather than on specific districts. Table 1 presents state averages of these indicators, subtracted from unity if appropriate, so that higher values indicate better outcomes (e.g., the second indicator actually measures child survival instead of child mortality).

Each indicator has been “normalised” using the same formula as in the initial international HDI, as follows:

\[ X_i = \frac{x_i - x_{\text{min}}}{x_{\text{max}} - x_{\text{min}}} \]

where \( X_i \) is the normalised indicator for district \( i \), \( x_i \) is the corresponding pre-normalisation figure, and \( x_{\text{max}} \) and \( x_{\text{min}} \) are the maximum and minimum values of the same indicator across all districts. The normalised indicator takes value 0 for the “bottom” district, 1 for the “top” district, and varies between 0 and 1 for other districts. Essentially, it tells us where a particular district stands, between the “top” and “bottom” districts (in terms of the concerned indicator), on a linear scale. For instance, a value of 0.5 means that the district is “half way” between the top and bottom districts.

Table 1: State Averages of Component Indicators (in %)

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<tr>
<th>State</th>
<th>Components of HDI Index</th>
<th>Components of ABC Index</th>
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<td>42.5</td>
<td>61.5</td>
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The HDI presented here is an unweighted average of the three normalised indicators. The district-specific HDI is displayed in Map 1 (p 44), where districts have been grouped into “quintiles” (each quintile includes one-fifth of all districts), with darker shades indicating lower HDI values.

2 The Geography of Deprivation

Elementary as this exercise may be, it draws attention to some important aspects of the geography of human deprivation in India. For instance, looking at the darkest districts, Map 1 highlights several regions that are known for high levels of human deprivation; these include southern Chhattisgarh (the former Bastar region), southern Orissa, northern and eastern Madhya Pradesh, the north-eastern part of Bihar, and the southern and western tips of Rajasthan. Less well understood perhaps is the fact that many districts of Uttar Pradesh, stretching across the entire state, also belong to this group. In fact, the whole “terai” belt stretching across Uttar Pradesh and Bihar along the Nepal border emerges as a problem area. On the other hand, all districts of Kerala and Himachal Pradesh belong to the top quintile of the HDI scale; this is in line with Kerala’s long-standing lead in matters of social development, and Himachal Pradesh’s more recent achievements in this field. Other states with high levels of human development in all districts include Tamil Nadu in the south, and Punjab and Haryana in the north. While these and a few other states have relatively uniform HDI levels across districts, there are major inter-district variations in most states. Maharashtra, for instance, includes some districts from the top HDI quintile, but also some in all other categories including the bottom quintile (e.g., Gadchiroli, bordering Chhattisgarh).
Broader regional patterns also emerge. Specifically, low-HDI districts are heavily concentrated in one massive, largely contiguous “lump” stretching across the large north Indian states (Bihar, Chhattisgarh, Jharkhand, Madhya Pradesh, Orissa, Rajasthan and Uttar Pradesh). All the bottom-quintile districts are part of this lump, and so are most of those in the second quintile (from the bottom), with the main exception of a few contiguous districts in northern Karnataka (Bellary, Gulbarga, Raichur and Koppal). Further, there are very few high-HDI districts in this area (e.g., virtually none from the top quintile of the HDI scale). The main exceptions are districts located around major cities such as Kanpur in Uttar Pradesh or Bhopal and Indore in Madhya Pradesh.

Outside this low-HDI area (hereafter the “northern heartland”), most districts fall into two contiguous zones. There is, first, a contiguous zone in the south, which includes the four southern states (Andhra Pradesh, Karnataka, Kerala and Tamil Nadu), and most of Gujarat and Maharashtra. This zone is virtually free of low-HDI districts, except for the patch of contiguous districts mentioned earlier (around northern Karnataka). Within this region, the most advanced area is Kerala, where every district belongs to the top quintile of the HDI scale. The second contiguous set of relatively high-HDI districts is located in the north-west, stretching across most of Punjab, Haryana and Himachal Pradesh. There are also a few high-HDI districts in West Bengal.

Another interesting aspect of Map 1 is that it suggests an important role for state policies. Within a state, human development levels tend to be relatively similar among contiguous districts. However, contiguous districts located in different states often have very different levels of human development. In other words, there are few discrete “jumps” (in levels of human development) across district boundaries within a state, but there are discrete jumps across state boundaries, e.g., between Maharashtra and Madhya Pradesh, or between Andhra Pradesh and Orissa, or between Uttar Pradesh and Uttarakhand. In some cases, this may reflect the fact that state boundaries coincide with some sort of natural or environmental barrier. State policies, however, are also likely to play a role.

### 3 A Child Development Index

We now extend this enquiry by presenting a summary index of the well-being of children. This is a normalised variant of the “Achievements of Babies and Children” (ABC) index, introduced in the *Focus On Children Under Six* (FOCUS) report. Briefly, this modified ABC index is constructed in the same manner as the HDI index, using the following four indicators: probability of surviving until age five; proportion of children fully immunised in the age group of 12-23 months; proportion of children aged 12-35 months who are not underweight; and female literacy rate in the 10-14 age group. Each indicator captures an important aspect of the well-being of children: survival until age five, full immunisation, adequate nourishment, and literacy, respectively. The last indicator focuses on girls specifically, to impart some gender sensitivity to the index. For state averages of these indicators, see Table 1.

The ABC index is presented in Map 2, in a format similar to Map 1, based on a grouping of districts into five even “quintiles”. The broad patterns are much the same as with the HDI (Map 1): the northern heartland is the big “problem region”, flanked by areas of higher child development in the north and south, with a patch of relatively low child development within the southern region, around northern Karnataka. The similarity between Map 1 and Map 2, in terms of broad contours as well as in some
(not all) of the finer details, is not entirely surprising. But it is not a trivial pattern either, considering that differences could emerge for at least three reasons: first, the two maps focus on different aspects of human development; second, Map 1 reflects the cumulative impact of living conditions over a long period of time (including, for instance, the state of the schooling system many years ago), while Map 2 captures children’s living environment in the recent past (that is, recent relative to 2001, the reference year); third, the HDI, unlike the AIBC index, includes an indicator of economic “living standard” (this is why, for instance, Punjab and Haryana fare better in terms of HDI than AIBC). In spite of the potential differences, however, the summary indexes point to very similar regional patterns.

Having said this, a few distinct features of Map 2 are worth noting. First, the north-south contrast in Map 2 is particularly striking. In the southern tip of India, including not only Kerala and Tamil Nadu but also substantial parts of southern Karnataka, almost every district belongs to the highest AIBC quintile. Conversely, in the north, there is a vast expanse of very low AIBC districts, stretching across most of Rajasthan, Uttar Pradesh, Bihar, Jharkhand and Madhya Pradesh.

Second, Chhattisgarh is now clearly demarcated from this problem region. There is some evidence that child development indicators have improved quite rapidly in Chhattisgarh in recent years. What Map 2 shows is that Chhattisgarh was already ahead of other parts of the so-called BIMARU states (undivided Bihar, Madhya Pradesh, Rajasthan and Uttar Pradesh) around the time of its formation in 2000. Quite likely, the gap is even wider today.

Third, in the southern region, the AIBC map sharply brings out not only Kerala’s but also Tamil Nadu’s “lead” in the field of child development. Kerala’s achievements in this regard are well known, but Tamil Nadu is not far behind, and the fact that all districts of Tamil Nadu are doing well in this respect is quite remarkable. This is consistent with, and consolidates, recent evidence of rapid improvements in child nutrition, healthcare and elementary education in Tamil Nadu in the post-Independence period, plausibly linked with active social policies including free and universal provision of essential public services.

Both the HDI and the AIBC index point to a resilient north-south contrast in matters of human and child development. Strictly speaking, this is not so much a north-south contrast as a contrast between what we call here the “northern heartland” and the rest of the country. Indeed, as one moves further north from there, e.g. into the extreme north-west (or for that matter north-east), human and child development indicators improve again. But with this qualification, the north-south dichotomy is quite striking.

This broad contrast is not new. It also relates, quite likely, to similar and widely discussed contrasts in gender relations, which tend to be more unequal and patriarchal in the north than in the south (although here again, “north-south” is actually a simplification of complex regional patterns). What is interesting is that the contrast shows little sign of disappearing or even diminishing. In fact, informal scrutiny of similar district-level data for 1981 (not presented here) suggests that the concentration of deprivation in the northern heartland has quite possibly increased between 1981 and 2001. This is also consistent with the fact that this pattern is somewhat more pronounced in the AIBC map than in the HDI map (bearing in mind that the latter reflects the cumulative impact of living conditions over a long period of time).

4 Component Indicators

The composite indexes presented so far help to highlight broad regional patterns of human and child deprivation. For instance, the heavy concentration of deprivation in the northern heartland, though fairly well known, emerges with special clarity in this approach. Having said this, much information is lost in the aggregation exercise, and the composite indexes should not substitute for continued attention to the component indicators.

To illustrate the issue, Maps 3 to 6 (p. 46) present the components of the AIBC index, in the usual format (with districts grouped in quintiles, and darker shades denoting worse indicators). There are broad similarities between the four maps, including the familiar north-south pattern, and some of these maps, notably the child immunisation map, look much like the AIBC map. However, there are also significant differences. Compare, for instance, the female literacy and child survival maps (Maps 3 and 4, respectively). Considering the well-known influence of women’s education on child health, one might expect the two maps to look much the same. But in fact, they are quite different. For instance, districts with high child mortality rates are concentrated in and around Madhya Pradesh, but the low-literacy belt (for the age group of 10-14 years) actually goes around Madhya Pradesh. The state combines high child mortality rates with relatively high literacy rates in the younger age groups, at least by north Indian standards. It is, thus, important to remain alive to the details of various indicators, and to acknowledge that “problem areas” are indicator-specific (beyond some broad patterns, such as Kerala doing well all-round).

The child nutrition map (Map 6) is also intriguing. In particular, this map does not display the “lumpy” configuration of the other maps, where contiguous districts tend to have similar levels of child development. In Maps 3 to 5 (and earlier maps), there are relatively few “discrete jumps” across district boundaries: contiguous districts tend to be in identical or adjacent quintiles of the relevant scale, so that the shades change in a smooth manner across the map. As noted earlier, there are occasional jumps across state boundaries, possibly reflecting differences in state policies. But generally, neighbouring districts tend to have relatively similar human or child development indicators.

The child nutrition map, however, is much less lumpy, and further, it shows many discrete jumps across district boundaries. This includes “long jumps”, from (say) top to bottom quintile, as one crosses some district borders, including borders between districts that have relatively similar social indicators otherwise, such as Sidhi (north-eastern Madhya Pradesh) and Koriya (north-western Chhattisgarh). There are other surprising features in Map 6, such as high levels of undernutrition in Uttarakhand, which is doing quite well on other indicators, and low levels of undernutrition in a string of districts of eastern Madhya Pradesh and western Chhattisgarh (Rewa, Satna, Shahdol, Koriya, Bilaspur) that are doing very poorly otherwise.
with big inter-district jumps around that area (e.g., between Dindori and Shahdol).

It is not clear whether these odd features of Map 6 are “real”, or whether they reflect high margins of error in the district-level estimates of child nutrition from DLHS-2 data. To probe this further, we aggregated the DLHS-2 nutrition indicators to the level of “regions”, and compared them with the corresponding estimates from the second National Family Health Survey (NFHS-2, conducted in 1998-99). The comparison is presented in Figure 1 (p 43) in the form of a scatter diagram. Clearly, there are major discrepancies between the two surveys as far as child nutrition indicators are concerned, even after allowing for the difference in reference years. Given that NFHS-2 data are considered reasonably credible in this respect (the NFHS-based regional patterns are fairly consistent with independent evidence), this casts some doubt on the accuracy of DLHS-2 estimates. The absence of reliable child nutrition data at the district level is an important gap in India’s statistical system, all the more serious as child undernutrition rates in India are among the highest in the world.
5 Update

By way of a quick update, Tables 2 and 3 present a simple HDI for Indian states, using more recent data. The component indicators are given in Table 2, with 2005 as the reference year (this is the latest year for which comprehensive data are available). Since the results are sensitive to the choice of indicators used to capture education, health and economic poverty (the three standard components of HDI-type indexes), we use three indicators for each aspect of human development, and give them equal weight. The normalisation and aggregation formulae are the same as before, with nine indicators instead of three.

In Table 3, the HDI is calculated in two ways: (1) with 2005 as the reference year, using the data given in Table 2; (2) using the latest available data for each indicator. Both ways, the results are much the same. We tried many variants of this index, but the basic patterns are fairly robust, as long as education, health and standard of living get roughly equal weights.

To interpret the results, it is useful to remember that the HDI is essentially an average (over different indicators) of the state’s position between the top and bottom states on a linear scale (see Section 1). It would take value 1 for a state that does best in terms of every indicator, and 0 for a state that does worst in terms of every indicator. The impressive value of 0.970 for Kerala reflects the fact that Kerala does best among all major states in terms of six of the nine indicators, and is very close to the others for the remaining three. Dire warnings about Kerala’s mortality rate of Himachal Pradesh has been used (both states have similar infant mortality rates).

Sources: See Table 2. The index is an unweighted average of normalised values for each of the 9 indicators presented in Table 2, using the normalisation rule mentioned in the text.

The states are ranked in decreasing order of HDI for 2005.

Table 2: Selected Indicators for Major States (2005)

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* Including Goa.

Sources: Figures with 2005-06 as reference year are from the third National Family Health Survey (International Institute for Population Sciences, 2007, and state reports for school attendance; poverty estimates 2004-05 from the Tendulkar Committee Report (as reprinted in Planning Commission 2012); reading proficiency and median per capita income from the India Human Development Survey (Desai et al 2010).
on the ABC index, using NFHS data for 1998-99, had already placed these three states at the top (Drèze, Khera and Narayanan 2007). During the last 10 years, all of them have made further rapid progress in terms of poverty reduction and social development (Chakraborty 2011). Each of these three states has pursued active social policies based on universalistic principles, at an early stage of development, when they were still quite poor. These policies were often criticised, at that time, for being profligate, unaffordable or “populist”. But there is no evidence that they have interfered with these states’ economic success. On the contrary, all three are now quite well-off in economic terms, aside from having much better social indicators than most other states.

The low-HDI states are the usual suspects: the large north Indian states that used to be known by the unflattering acronym of BIMARU (or rather BIMAROU, with Orissa added). In fact, there is a striking gap between these states and the rest: the next state – from the bottom – in this ranking is Assam, with a much higher HDI.

Bihar is the state with lowest HDI, by a long margin. This is a familiar pattern, but it is sometimes forgotten in the prevailing mood of enthusiasm for Bihar’s recent progress (or alleged progress). It is quite possible that the state’s changing political priorities, with greater emphasis on development, will show results in due course. But as things stand, there is little evidence of a human development breakthrough in Bihar, even in the most recent data. For instance, Bihar is the only state where poverty (especially rural poverty) did not decline to any significant extent between 2004-05 and 2009-10, according to official estimates (Planning Commission 2012). The accumulated damage of decades of indifference towards people’s basic needs is enormous, and will take a long time to repair.

Uttar Pradesh is another human development disaster, with, for instance, only 39% of children aged 8-11 being able to pass a simple reading test (going beyond liberal definitions of “literacy”), and only 23% of young children being fully immunised. Like Bihar, Uttar Pradesh is held up by a heavy burden of historical inequalities (of class, caste and gender), and also by decades of state apathy towards common people (Drèze and Gudar 1996). The dismal state of human development in Uttar Pradesh is not a trivial matter, considering that Uttar Pradesh has a larger population (about 200 million) than any country in the world except China, India, Indonesia and the United States. Uttar Pradesh’s population is expected to grow to 300 million or so by 2026, and more than 400 million by the end of the century, an interesting prospect.

As Table 3 illustrates, there are tentative indications of Chhattisgarh and Rajasthan detaching themselves a little from the rest of the northern heartland, leaving the JUMBO states (Jharkhand, Uttar Pradesh, Madhya Pradesh, Bihar and Orissa) behind. However, too much should not be made of this convenient acronym. For one thing, this pattern is somewhat sensitive to the choice of indicators. For another, Chhattisgarh’s recent achievements (e.g., in terms of child health or food security) should be seen in the light of its atrocious record of state repression, human rights violations and forced displacement of tribal communities, particularly in the former Bastar region.

A similar remark applies to the north-eastern states as well as to Jammu and Kashmir. For most of the indicators in Table 2, the average for the north-eastern region (approximated as a population-weighted average of state figures) is higher than the all-India average. Jammu and Kashmir, for its part, comes sixth among 20 major states in the HDI ranking – see Table 3. However, there is a dreadful trail of human rights violations and suppression of civil liberties in the northern-eastern region as well as in Jammu and Kashmir. This is a useful reminder of the limitations of “social indicators” as a barometer of development.

### 6 Concluding Remarks

The geography of deprivation in India varies for different aspects of social development. Different regions emerge as the “problem areas” depending on whether one is focusing on, say, rural poverty, or child mortality, or female literacy. For instance, Madhya Pradesh has high mortality rates, but is now doing relatively well (at least in comparison with other northern states) in terms of literacy in the younger age groups.

Interestingly, however, two different summary indexes of deprivation point to very similar general regional patterns. Among other robust patterns is one of widespread deprivation across most of the northern heartland. On each side of this region, there are contiguous areas with relatively high levels of human development, in the north and the south. But there is also a smaller problem region in the south – a patch of contiguous districts around northern Karnataka. Within the northern heartland, areas that seem to call for special attention include southern Orissa, southern Chhattisgarh, southern Rajasthan, northern Madhya Pradesh, and large parts of Bihar, Jharkhand and Uttar Pradesh.

While these patterns are not surprising, they are perhaps worth noting at a time when the geography of deprivation in India is often confused by an exaggerated focus on indicators that are actually hard to interpret. For instance, there are frequent attempts to “rubbish” Kerala’s achievements based on indicators such as suicide rates or alcoholism. Suicide rates have also put states such as Andhra Pradesh and Karnataka in a grim light. Without denying that suicides and alcoholism are major social concerns, it is important not to miss the wood for the trees.

There is also a questionable narrative of rapid “catch-up” of the northern states with the rest of the country in the last 10 years or so (Institute of Applied Manpower Research 2011). The findings presented in this paper are not incompatible with the possibility of some “convergence” over time, across states, in levels of human development. Indeed, convergence need not affect rankings of states or districts – the main focus of this paper. However, at least some of the alleged evidence of recent convergence is based on misleading measures of progress. And if there is some convergence, there is also an issue of speed, considering the enormous gap that separates the northern heartland from most other states. The updated state HDIs presented earlier suggest that whatever convergence may have taken place has not made much of a dent in this considerable gap. Hopefully, the release of detailed census data for 2011 will soon make it possible to re-examine the convergence story.
Also, in Table 3, if the HDI is recalculated after discarding 2005 data and using only those indicators for which more recent data are available (see note "b" in Table 3), Bihar looks even worse, with a human development index of 0.073.


16 According to the latest National Crime Records Bureau data, suicide rates in all the southern states are much higher than the national average; among the major states, Bihar has the lowest suicide rate, followed by Uttar Pradesh (National Crime Records Bureau 2011: xvii).

17 For evidence of convergence in the 1980s and 1990s, see Chakravorty (2003) and Ghosh (2006, 2011).

18 See Chakraborty’s (2011) critique of this aspect of the recent India Human Development Report (Institute of Applied Manpower Research 2011). Similar criticisms apply to some of the earlier research on convergence in the 1980s and 1990s.

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