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Poverty, Human Development and Health Financing in India

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Abstract

Health constitutes one of the important determinants of human development. There are notable differentials across the Indian states in terms of human development, life expectancy and per capita incomes. Generally the HDI indices portray a better picture for better off states relative to their less well off counterparts. This study aims at analyzing the differentials across rich and poor states and across rich and poorer strata and rural urban segments of 19 major Indian states. The study indicates that besides individual health financing policies of the respective state governments, there are significant disparities even between rural and urban strata and rich and poorer sections of the society. These are indicated by high inequality coefficients and an emerging pattern of life style second generation health problems as well as levels of utilization of both preventive and curative care both in public and private sectors. Our results indicate that rather than more reliance on private sector an appropriate fine tuning of health financing strategy may be called for to mitigate partly the inequitable outcomes.

Keywords: *Human development, health financing, rich, poor, rural, urban.*

JEL Codes: I 140

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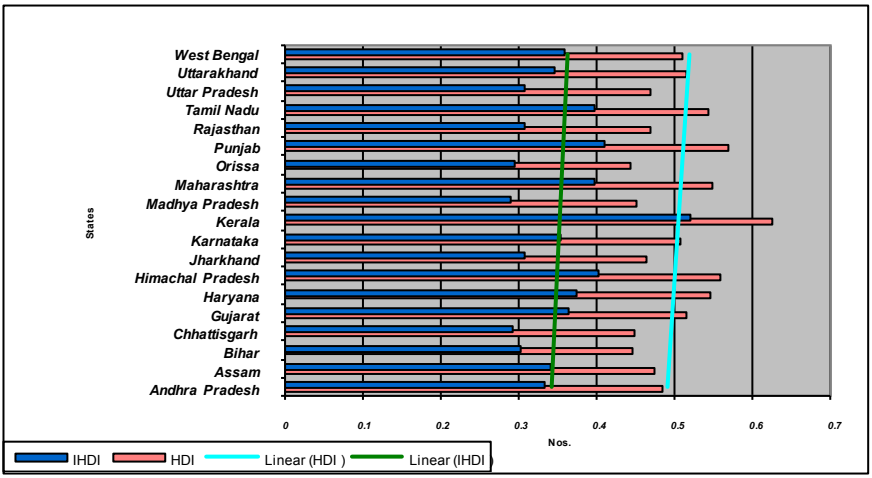
INTRODUCTION

In this paper we compare rural and urban health challenges and examine differences in human development and health outcomes. The following section explains situation in regard to human development and budgetary financing in Indian states. This is followed by basic framework for our analysis and data base. The next section addresses the variations in health indicators across rural and urban areas and assesses their potential causes, including inadequate access to infrastructure, health services, and education. The last section concludes with our findings and suggestions.

Human Development and Budgetary Financing: Poor Vs. Rich States

A broad view of the human development indices across major Indian States is presented in Chart 1. This is indicated by HDI bars. These generally are depicting a lower index value for low income states like Orissa, Bihar, Chattisgarh and Madhya Pradesh as the states which rank lowest and with the sequence moving to better off states ranking higher in HDI with Kerala, Punjab, HP and Maharashtra among the top five states. However, there has been a concern about rising inequalities and uneven distribution of the benefits of growth and to explicitly capture quantification of the potential loss due to inequality with respect to access to education and health, recently a study by UNDP provides another index, called as Inequality adjusted Human Development Index (IHDI) and it is based on methodology proposed in the 2010 Human Development Report. To facilitate a comparison between usual HDI indices and newly presented IHDI, we have also presented both of these in Chart 1 and Table 1 for major Indian States. With this new index the four lowest ranking states become MP, Chattisgarh, Orissa and Bihar whereas the top four ranking states are Kerala, Punjab, HP and Maharashtra. In both the set of indices, we find that poorer states continue to remain low and better off states remain higher.

Chart1: HDI and IHDI for Major Indian States(2011)



Source: Based on estimates from Suryanarayana et. al (2011).

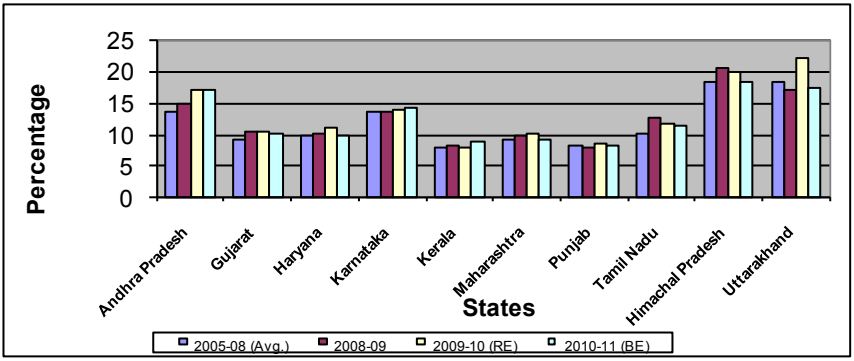
Table 1: HDI and IHDI Estimates Across Indian States

State	HDI	IHDI	Rank HDI	Rank IHDI	Difference
Andhra Pradesh	0.485	0.332	11	12	-1
Assam	0.474	0.341	12	11	1
Bihar	0.447	0.303	18	16	2
Chhattisgarh	0.449	0.291	17	18	-1
Gujarat	0.514	0.363	8	7	1
Haryana	0.545	0.375	5	6	-1
HimachalPradesh	0.558	0.403	3	3	0
Jharkhand	0.464	0.308	15	14	1
Karnataka	0.508	0.353	10	9	1
Kerala	0.625	0.520	1	1	0
Madhya Pradesh	0.451	0.290	16	19	-3
Maharashtra	0.549	0.397	4	4	0
Orissa	0.442	0.296	19	17	2
Punjab	0.569	0.410	2	2	0
Rajasthan	0.468	0.308	14	13	1
Tamil Nadu	0.544	0.396	6	5	1
Uttar Pradesh	0.468	0.307	13	15	-2
Uttarakhand	0.515	0.345	7	10	-3
West Bengal	0.509	0.360	9	8	1
India	0.504	0.343			

Source: Same as Chart 1

In view of the distinct differential across rich and poor states in terms of their human development indices, we have compared the financing situation with respect to these groups of states[1] . Chart 2 and 3 present an overview of social sector expenditure in these categories of states between the financial years 2005-11. It is pertinent to note that social sector in special category states like HP and newly created states like Uttarakhand have been higher than their richer state counterparts like Karnataka, Kerala, Maharshtra, and Gujarat (Chart 3). A similar situation is noted in regard to Assam, Bihar and MP which have percentage of social sector expenditure to their GSDP as higher than other poorer states in the group. This indeed indicates that the other components of social sector expenditure rather than health and education have comprised larger chunk in these states and thus it is reflected in the lower HDI indices in poorer states despite their overall social sector expenditure being higher than others.

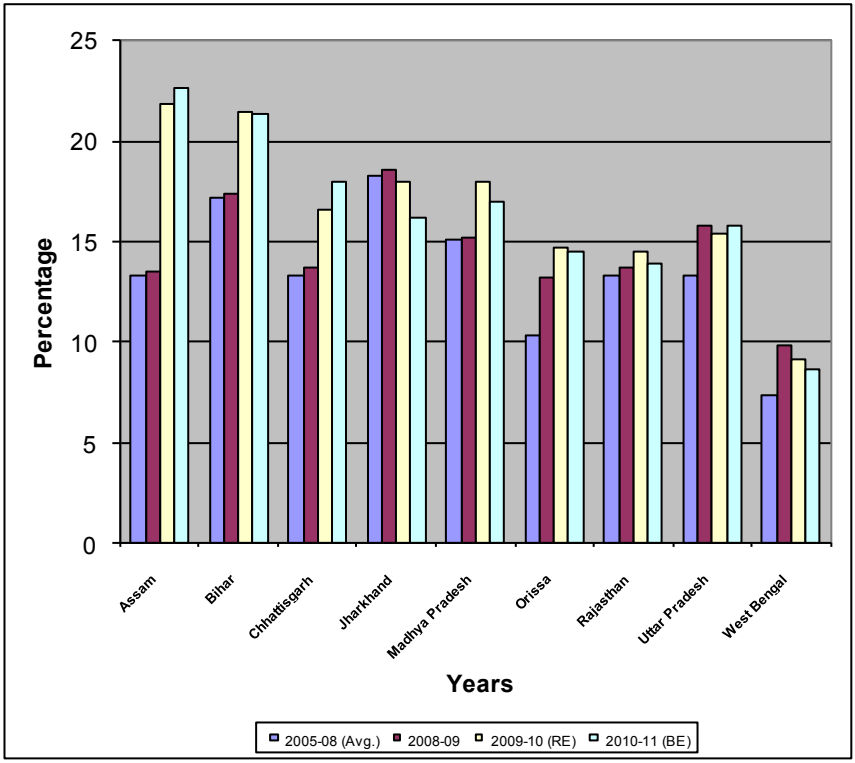
Chart 2: Social Sector Expenditure as % of GSDP: Rich and Average Income states, 2005-11



Source: RBI, 2011

[1] The states considered here are poor, middle income(or average) and rich depending upon their per capita income being much below, nearer or much above all India average per capita income of Rs. 27123 in 2005-06 (the year of NFHS survey which we also use later in the paper). Poor states include Assam, Bihar, Chattisgarh, Jharkhand, MP, Orissa, Rajasthan, UP and WB. Middle income states include AP and Uttarakhand. Rich states include Gujarat, Harayana, HP, Karnataka, Kerala, Maharashtra, Punjab and Tamil Nadu.

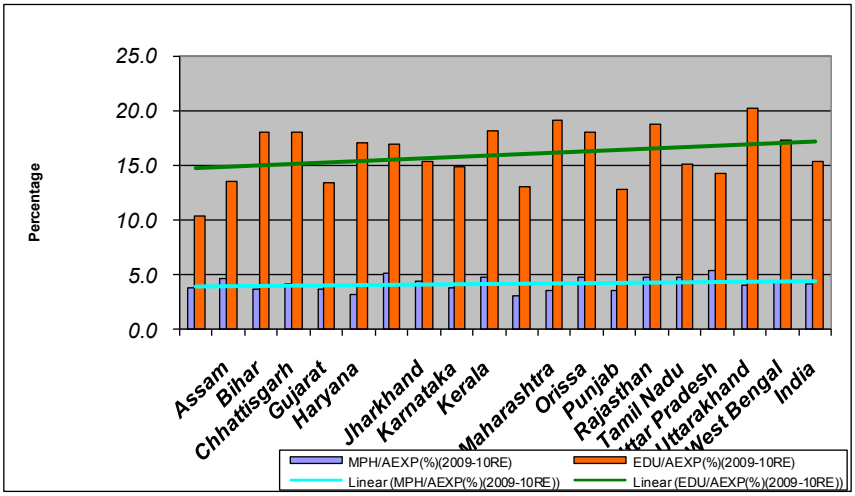
Chart 3: Social Sector Expenditure as % of GSDP: Poor States, 2005-11



Source: RBI, 2011

This is reinforced by the budgetary expenditure on health and education presented for major Indian states for 2009-10 (Chart 4) and the growth rate of these expenditures for the rich and poor states separately for the financial years from 2000-2011 (Chart 5 and 6). Generally a higher proportion of education (on an average around 15%) is depicted in the trend line in these charts in contrast to (around 4 percent) medical and public health.

Chart 4: Budgetary Exp. on Health and Education for Major Indian States(2009-10)



Source: RBI, 201

Chart 5: Average Income and Rich States: Growth Rate of Budgetary Exp on Health, 2000-11

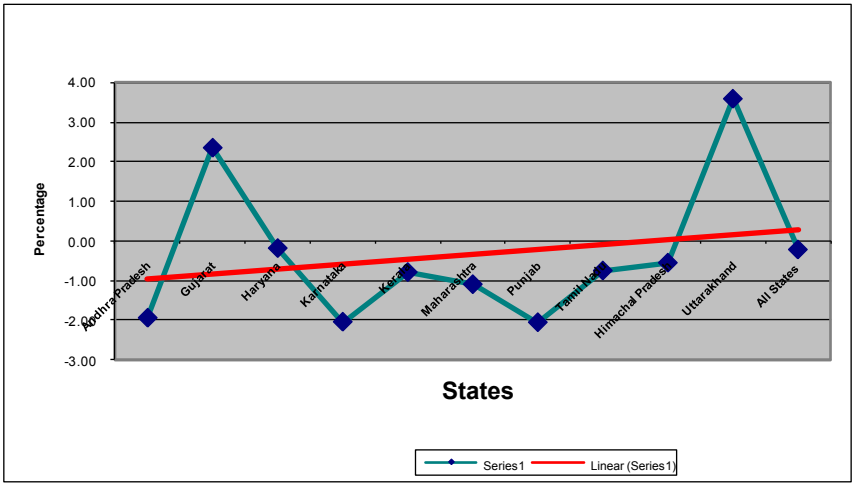
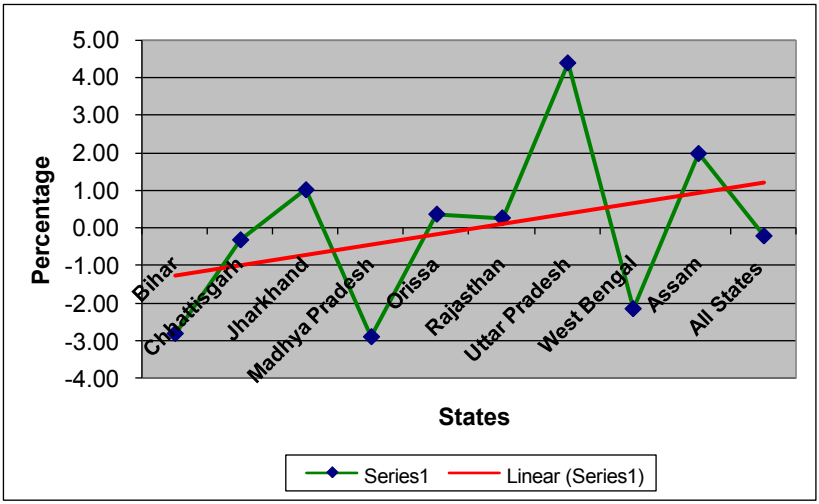
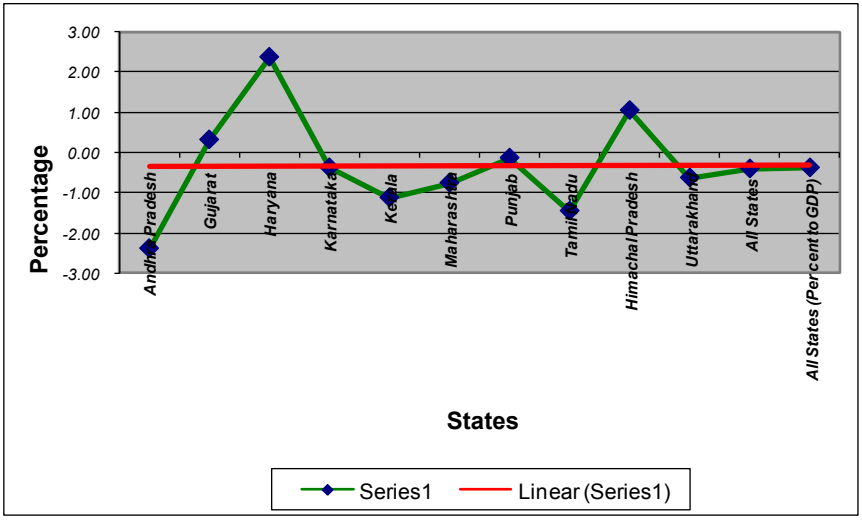


Chart 6: Poor States: Growth Rate of Average Expenditure on Health, 2000-11



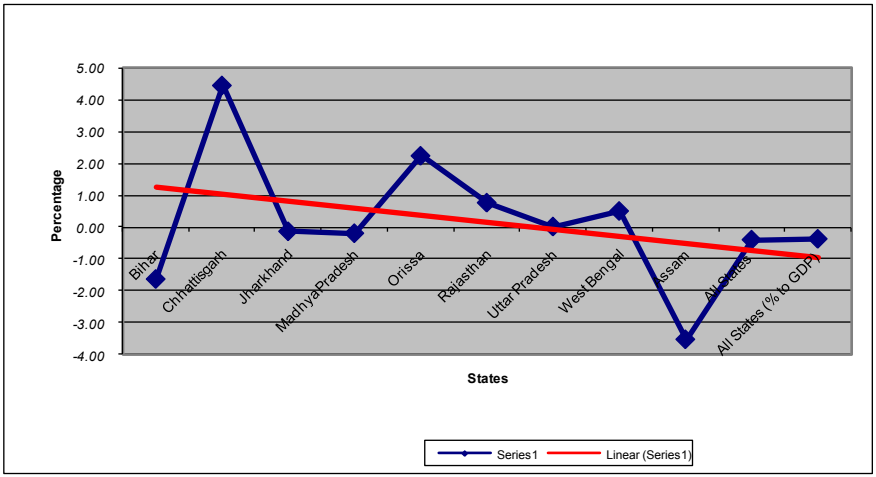
Source: Estimated from RBI, 2011

Chart 7: Average and Rich States: Growth Rate of Average Education Expenditure, 2001-11



Source: Estimated from RBI, 2011

Chart 8: Poor States: Growth Rate of Average Education Expenditure (Growth Rate 2000-11



Source: Estimated from RBI, 2011

BASIC FRAMEWORK FOR OUR ANALYSIS AND DATA BASE

Our focus in this paper is more on health and human development perspective. In the literature, basic approach to the demand for health as developed initially by Grossman (1972) has been labeled as the human capital model because it draws heavily on human capital theory (Becker (1964, 1967), Ben-Porath (1967), Mincer (1974))[2]. According to human capital theory, increases in a person's stock of knowledge or human capital raise his productivity in the market sector of the economy, where he produces money earnings, and in the non market or household sector, where he produces commodities that enter his utility function. To realize

[2] This framework was used by Becker (1967) and by Ben-Porath (1967) to develop models that determine the optimal quantity of investment in human capital at any age. In addition, these models show how the optimal quantity varies over the life cycle of an individual and among individuals of the same age.

potential gains in productivity, individuals have an incentive to invest in formal schooling and on-the-job training. The costs of these investments include direct outlays on market goods and the opportunity cost of the time that must be withdrawn from competing uses.

Grossman approach uses the household production function model of consumer behavior (Becker (1965), Lancaster (1966), Michael (1973)) to account for the gap between health as an output and medical care as one of many inputs into its production. This model draws a sharp distinction between fundamental objects of choice--called commodities--that enter the utility function and market goods and services. Consumers produce commodities with inputs of market goods and services and their own time. For example, they use sporting equipment and their own time to produce recreation, likewise they use medical care, nutrition etc. to produce health. The concept of a household production function is perfectly analogous to a firm production function. Each relates a specific output or a vector of outputs to a set of inputs. Since goods and services are inputs into the production of commodities, the demand for these goods and services is a derived demand for a factor of production. That is, the demand for medical care and other health inputs is derived from the basic demand for health.

There is an important link between the household production theory of consumer behavior and the theory of investment in human capital. Consumers as investors in their human capital *produce* these investments with inputs of their own time, books, teachers' services, and computers. Thus, some of the outputs of household production directly enter the utility function, while other outputs determine earnings or wealth in a life cycle context. Health, on the other hand, serves both the functions.

Thus in Grossman model, health--defined broadly to include longevity and illness-free days in a given year--is both demanded and

produced by consumers. Health is a choice variable because it is a source of utility (satisfaction) and because it determines income or wealth levels. That is, health is demanded by consumers for two reasons. As a consumption commodity, it directly enters their preference functions, or, put differently, sick days are a source of disutility. As an investment commodity, it determines the total amount of time available for market and non market activities. In other words, an increase in the stock of health reduces the amount of time lost from these activities, and the monetary value of this reduction is an index of the return to an investment in health.

Since health capital is one component of human capital, a person inherits an initial stock of health that depreciates with age--at an increasing rate at least after some stage in the life cycle--and can be increased by investment. Death occurs when the stock falls below a certain level, and one of the novel features of the model is that individuals "choose" their length of life. Gross investments are produced by household production functions that relate an output of health to such choice variables (or health inputs) as medical care utilization, diet, exercise, cigarette smoking, and alcohol consumption. In addition, the production function is affected by the efficiency or productivity of a given consumer as reflected by his or her personal characteristics. Efficiency is defined as the amount of health obtained from a given amount of health inputs. Since the most fundamental law in economics is the law of the downward sloping demand function, the quantity of health demanded should be negatively correlated with its "shadow price." It is stressed that the shadow price of health depends on many other variables besides the price of medical care. Shifts in these variables alter the optimal amount of health and also alter the derived demand for gross investment and for health inputs. The shadow price of health rises with age if the rate of depreciation on the stock of health rises over the life cycle and falls with education (years of formal schooling completed) if more educated people are more efficient producers of health. Grossman emphasizes that, under

certain conditions, an increase in the shadow price may simultaneously reduce the quantity of health demanded and increase the quantities of health inputs demanded.

To develop empirically testable hypotheses, a model of the demand for health defined in terms of different indicators of mortality and diseases is specified. The model concentrates on the role of money prices, time prices, earned and non-earned income and health insurance. A number of socio-economic variables including religion, caste, education, assets are also used in empirical estimation. For simplicity, the formal model is developed in terms of only one provider of health, but the implications for several providers can easily be drawn.

Let the intertemporal utility function of a typical consumer be

$$u = u(\Delta_t H_t, Z_t),\ t = 0, 1, \ldots, n,$$

where H_t is the stock of health at age t or in time period t, Δ_t is the service flow per unit stock, $ht = \Delta_t H_t$ is total consumption of "health services," and Z_t is consumption of another commodity.

The stock of health in the initial period (H_0) is given, but the stock of health at any other age is endogenous. The length of life as of the planning date (n) also is endogenous. In particular, death takes place when $H_t\ \Delta H_{min}$. Therefore, length of life is determined by the quantities of health capital that maximize utility subject to production and resource constraints.

If we write $ht = \Delta_t H_t = m$ denoting medical services or any other commodity or characteristic leading to health and assume that two goods enter the individual's utility function: medical services m, and a composite X, for all other goods and services; and also presume a fixed proportions of money and time to consume m and X, combined these

with the full wealth assumption, the model can be represented as follows[3]:

Maximize

$$U = U(m,X)$$

subject to

$$(p + wt)m + (q + ws)X \leq y + wT = Y,$$

where

U = utility.
m= medical services,
X= all other goods and services.
p =out-of-pocket money price per unit of medical services,
t=own-time input per unit of medical services consumed, t
q= money price per unit of X.
s =own-time input per unit of X,
w =earnings per hour.
Y= total (full) income,
y= non-earned income, and
T= total amount of time available for market and own production of goods and services.

Here the consumption of medical services, m, does not affect the amount of time available for production, T.

Using the above basic consumption model formulation, the effect of various parameters on health could be tested in a regression framework. The literature broadly from the health economics field on the determinants of health outcomes in populations mainly indicate five sets of factors that could be considered important to explore. These include socioeconomic status, access to health services, environment and others including nutrition and personal attributes (WHO/UNICEF 2004).

[3] This formulation is largely based on Acton(1973)

Generally, rural and urban populations tend to differ with respect to many health indicators. It is typically presumed that the urban population is better off. The reality is depicted more vividly when a disaggregate scenario is analyzed using an acceptable measure of income categories. Empirically and rather paradoxically to presumption of better urban health, in some countries like Colombia and Peru, indicators suggest that the urban poor are worse off than their rural counterparts, and the health status of the urban population varies widely across countries, provinces and city sizes (Flores 2000, Bitrán, Giedion, Valenzuela, and Monkkonen 2003). In addition, urban populations are more susceptible due to degradation of physical environment. For instance, a study on São Paolo, Brazil, finds that an increase in airborne contamination (which is higher in cities) results in increased hospitalization due to respiratory illness and pneumonia (Gouveia and Fletcher 2000).Thus it is another set of presumption that higher income is positively correlated with better health, with the direction of causality clearly established from wealthier to healthier (Pritchett and Summers 1996), urban poor can experience problems with their physical environment that are distinct from and have greater negative health impacts than those faced by their rural counterparts and personal hygiene, nutrition, choice of physical activities and employment can have an extremely important effect on health in terms of incidence of obesity, heart disease, cancer, sexually transmitted diseases and similar kind of chronic lifestyle diseases. A notable trend across the globe is a steady increase in urban populace with nearly one third of these urban dwellers having a living in urban slums. It is estimated that of the nearly 30 % of India's population or about 300 million people live in towns and cities and nearly 100 million of them live in slums which are characterized by overcrowding, poor hygiene and sanitation and the absence of proper civic services[4].Thus in definite ways, it is not an exaggeration to presume that health of the urban poor is as worse as the rural population.

[4] See for instance, Kantharia SL National Journal of Community Medicine 2010, Vol. 1, Issue 1

By systematic planning since independence, health system in India is more focused towards the rural areas having an organizational structure right from grass root to tertiary care managed by dedicated staff. In contrast however there is a huge deficiency of any such health care structure in the urban areas. Majority of health care in urban area is served by the private sector but its costing, distance and many other factors make private sector facilities out of reach of most urban poor residents. Health care system in India in the last 45 years has focused on increasing coverage in rural areas. It has been assumed that with high concentration of health facilities and services in the cities compared with rural areas, urban health problems are less. But in fact, for the urban poor, the level of access to health facilities falls below the minimum equitable level, where primary health care facilities, their location, resources, quality and performance are often poor, their links to deprived communities are inadequate and their utilization is low (WHO1992). Thus, there exist wide gap in the utilization pattern of health services and health improvement in urban area.

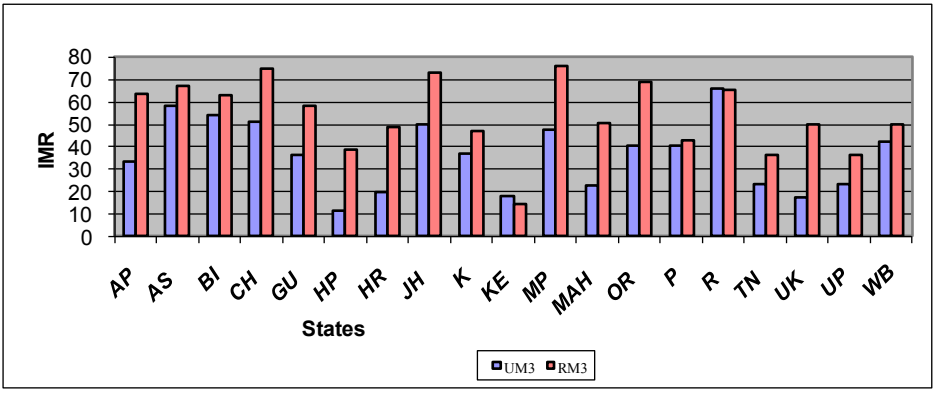
Thus, a priori, based on the formal model of demand for health services one can expect that time will function as a normal price, demand for free care will be more sensitive to changes in time prices than will demand for non-free care. The elasticity of demand for medical services with respect to non-earned income should be positive and the elasticity of demand with respect to earned income is indeterminate but the price effect may dominate for free care (and thus reduce demand) and the income effect may dominate for non-free care (and thus increase demand). Further in the absence of differences in taste for particular types of providers, more education may reduce the demand for care. If there are taste differentials (with the more educated preferring private care), there may be a negative elasticity with respect to education for public care and an elasticity biased upward (possibly positive) for private care.

In order to carry out regression exercise we have made use of NFHS state level reports National Family Health Survey 2005-06(NFHS-3). The 19 states are included in our analysis comprise 19 states. These include Andhra Pradesh, Assam, Bihar, Chhatisgarh, Gujarat, Himachal Pradesh, Harayana, Jharkhand, Karanataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Punjab, Rajasthan, Tamil Nadu, Uttarakhand, Uttar Pradesh and West Bengal.

RURAL VS URBAN AREAS

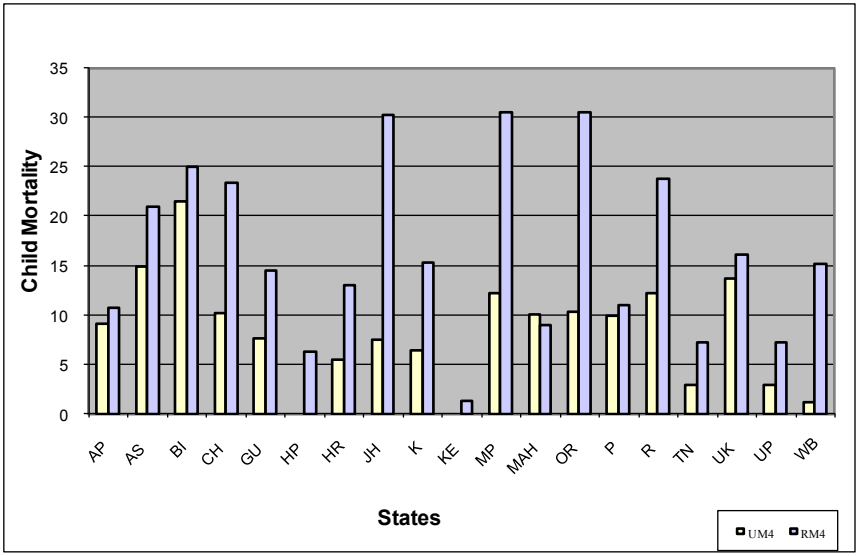
A comparative profile of rural and urban sectors across 19 states is presented in Charts below. It could be observed that all the three types of mortality indicators namely infant mortality (IMR), child mortality (CMR) and under five mortality (UFMR) except for Kerala are higher for rural areas relative to their counterparts in urban areas (Charts 9-11). Except Rajasthan (for IMR), this differential is very glaring for other states.

Chart 9: Infant Mortality (Rural Vs. Urban)



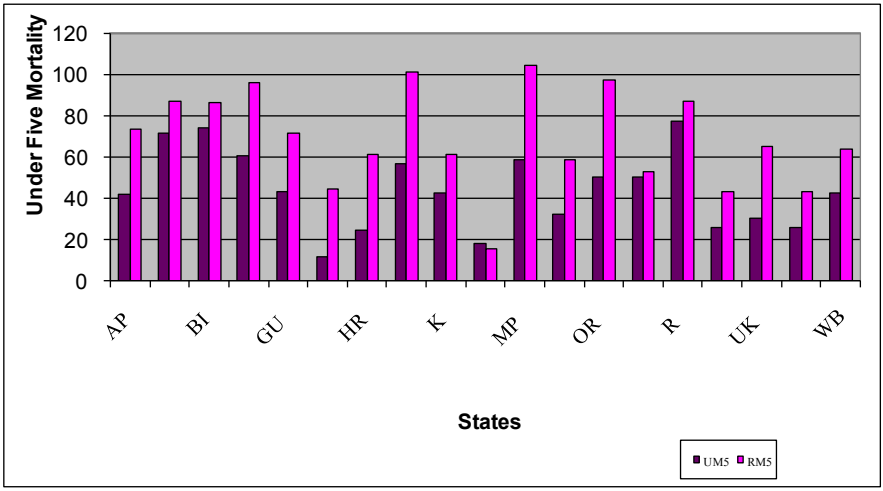
Source: IIPS and Macro International. 2008.

Chart 10: Child Mortality (Rural and Urban)



Source: IIPS and Macro International. 2008.

Chart 11: Under Five Mortality(Rural and Urban)



Source: IIPS and Macro International. 2008.

Table 2: Performance of States in Major Rural Variables (Ranks)

States→	AP	AS	BI	CH	GU	HP	HR	JH	K	KE	MP	MAH	OR	P	R	TN	UK	UP	WB
Health Insurance	9	14	17	16	4	5	7	9	1	2	14	8	18	6	9	13	3	18	12
BPL Card Holders	1	14	4	8	7	17	18	5	2	6	10	11	3	13	16	19	9	15	12
Lowest Wealth Index	13	9	7	2	14	19	16	1	12	18	3	10	4	17	8	11	15	6	5
Highest Wealth Index	8	10	14	19	6	3	5	18	11	1	17	7	14	2	12	9	4	13	16
No education Male	3	13	1	7	11	18	10	2	6	19	4	16	8	9	5	14	17	14	12
No education Female	6	17	2	5	10	18	8	3	9	19	4	11	7	15	1	13	12	13	16
Underweight Children	16	14	3	4	5	15	12	2	13	19	1	11	8	18	7	17	10	6	9
Anaemia Children	6	10	1	7	3	18	4	5	7	19	2	11	13	14	9	16	17	12	15
Anaemia Women	5	2	3	9	7	11	17	1	14	19	8	15	6	18	12	13	10	16	4
Diabetes Women	13	16	5	6	10	7	4	14	11	1	19	15	12	8	17	2	9	18	3
Asthma Women	4	10	6	8	17	7	19	12	15	1	11	5	3	14	9	16	18	13	2
Goitre Women	5	8	6	14	12	13	10	3	7	1	9	15	17	11	18	2	19	16	4
Diabetes Men	3	12	4	10	19	14	18	16	8	2	7	13	6	9	17	5	11	15	1
Asthma Men	4	11	12	3	17	9	18	19	15	2	14	6	7	16	5	13	10	8	1
Goitre Men	3	2	6	15	16	10	8	18	7	1	5	12	17	9	18	11	13	14	4
IMR	7	5	8	2	9	16	13	3	14	19	1	10	4	15	6	17	11	17	12
Child Mortality	14	7	4	6	11	18	12	3	9	19	1	15	1	13	5	16	8	16	10
Under Five Mortality	8	6	7	4	9	16	13	2	12	19	1	14	3	15	5	17	10	17	11

Source: IIPS and Macro International. 2008.

The rank of MP is highest in terms of all the three mortality indicators whereas UP and Tamil Nadu seem to be at the bottom leaving the exception of Kerala which has in fact the lowest mortality in the country (Table 2). Most of the poorer states like Chhatisgarh, Jharkhand, Orissa and Assam comprise the top five mortality states as ranked by IMR. The better off states (relative to all India average in per capita income) are also having a better situation in terms of mortality indicators (Charts 9-11 and Table2). A similar observation could be made in terms of urban mortality differentials where poorer states like Rajasthan (top IMR in urban areas), Assam, Bihar, Chhatisgarh and Jharkhand are the first top five mortality states in IMR (Table 3). By contrast, generally richer states like Gujarat, Maharashtra and Punjab are lower in the IMR ranks for urban areas. There is an improved position and mixed trend for middle income states like AP, and rich ones like

Karnataka and Tamil Nadu which fall mostly under lower ranking IMR states with some variations in relative rankings pertaining to other mortality indicators of CMR and UFMR (Table 3).

Table 3: Performance of States in Major Urban Variables (Ranks)

States→	AP	AS	BI	CH	GU	HP	HR	JH	K	KE	MP	MH	OR	P	R	TN	UK	UP	WB
Health Insurance	15	17	19	7	1	12	3	5	8	10	4	6	14	8	10	16	13	18	2
BPL Card Holders	1	14	5	6	9	16	13	11	2	3	7	12	4	16	10	19	18	15	8
Lowest Wealth Index	7	8	2	3	15	18	19	5	10	17	4	13	1	16	13	6	11	9	11
Highest Wealth Index	18	17	16	14	7	1	4	11	9	8	12	5	15	3	5	19	2	10	13
No education Male	2	15	1	14	16	17	10	5	8	19	4	18	13	3	9	11	5	11	7
No education Female	4	17	1	10	14	18	6	5	7	19	3	16	11	8	2	12	9	12	15
Underweight Children	12	14	2	7	3	17	6	4	8	19	1	8	11	18	10	13	16	5	15
Anemia Children	7	12	5	4	11	18	3	14	5	19	1	13	16	8	10	9	15	2	17
Anemia Women	3	2	1	9	11	7	18	5	13	19	15	16	6	17	14	8	10	12	4
Diabetes Women	6	16	5	11	14	3	15	8	13	1	9	18	10	12	19	2	7	17	4
Asthama Women	4	8	9	7	16	6	19	12	10	1	14	11	2	17	5	13	18	15	3
Goitre Women	4	13	9	16	7	19	5	18	10	1	17	12	14	11	8	3	15	6	2
Diabetes Men	3	13	16	17	2	12	15	10	8	1	19	9	4	11	18	7	6	14	5
Asthama Men	3	8	14	9	7	6	19	17	15	2	5	4	10	12	11	18	16	13	1
Goitre Men	6	7	18	18	3	2	9	11	13	1	8	12	14	15	4	16	10	17	5
IMR	12	2	3	4	11	19	16	5	10	17	6	15	9	8	1	13	18	13	7
Child Mortality	4	19	1	15	5	10	12	13	6	10	2	3	16	14	17	7	18	7	9
Under Five Mortality	6	18	1	17	3	10	12	16	4	11	2	7	15	14	19	8	13	8	4

Source: IIPS and Macro International. 2008.

Thus, it is pointed out that even among the poorer or richer states there is a considerable disparity between rural and urban areas. Generally rural areas also have higher inequitable distributions as depicted by the Gini coefficients (Table 4). The inequitable distribution of income across rural and poorer areas also comes to the fore if we glance at the composition of the respective populations in terms of lowest and highest wealth index as provided by NFHS[5]. A uniform scenario as

[5] The wealth index is constructed by NFHS by combining information on 33 household assets and housing characteristics, such as ownership of consumer assets, type of dwelling, source of water, and availability of electricity, into a single wealth index. The household population is divided into five equal groups of 20 percent each (quintiles) at the national level from 1 (lowest, poorest) through 5 (highest, wealthiest). Since the quintiles of the wealth index are defined at the national level, the proportion of the population of a particular state that falls in any specific quintile will vary across states

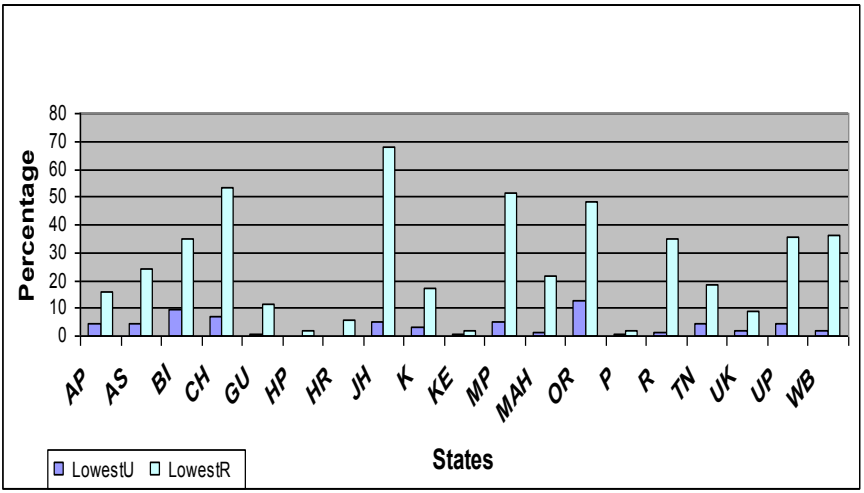
depicted in Charts 12-13 indicate that rural areas have major proportion among lower wealth index and urban areas have a majority of highest wealth index in all the states with an exception of Kerala. This is in turn making a majority of BPL card holders having their living in rural areas (Chart 14)

Table 4: Gini Coefficients for Rural and Urban Areas (19 states)

Gini Coefficients	Urban	Rural
Health Insurance	0.20743	0.42913
BPL Card Holders	0.39207	0.25883
Lowest Wealth Index	0.48091	0.41598
Highest Wealth Index	0.13522	0.51614
No education Male	0.18910	0.19304
No education Female	0.16367	0.16121
Underweight Children	0.14884	0.12398
Anemia Children	0.06899	0.05905
Anemia Women	0.09284	0.10004
Diabetes Women	0.27507	0.36573
Asthama Women	0.27476	0.29656
Goitre Women	0.43143	0.44220
Diabetes Men	0.39090	0.37094
Asthama Men	0.31808	0.35526
Goitre Men	0.53191	0.52965
IMR	0.23769	0.16090

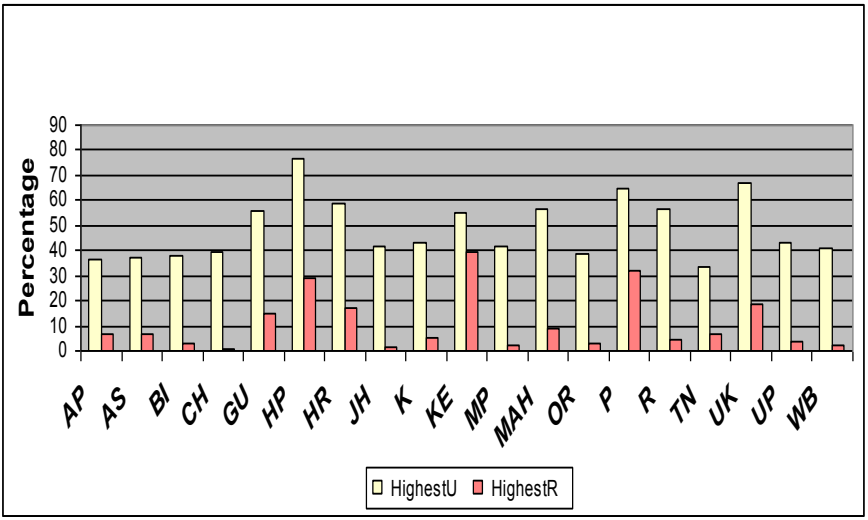
Source: IIPS and Macro International. 2008.

Chart 12: Percentage of People with Lowest Wealth Index (Rural vs. Urban)



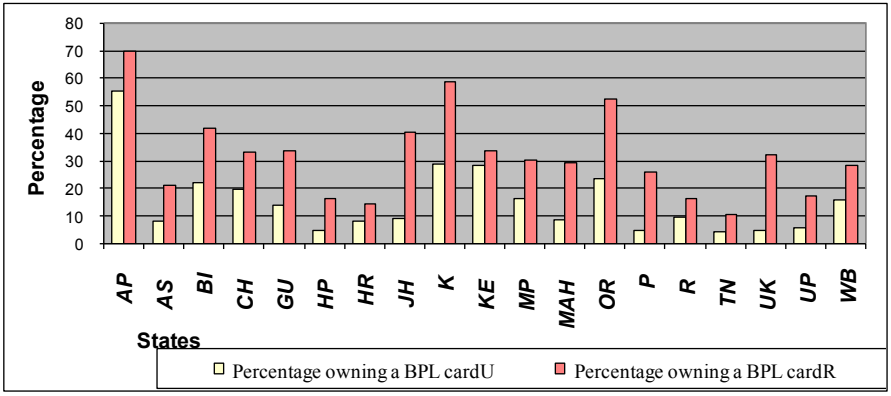
Source: IIPS and Macro International. 2008.

Chart 13: Percentage of People with Highest Wealth Index (Rural vs. Urban)



Source: IIPS and Macro International. 2008.

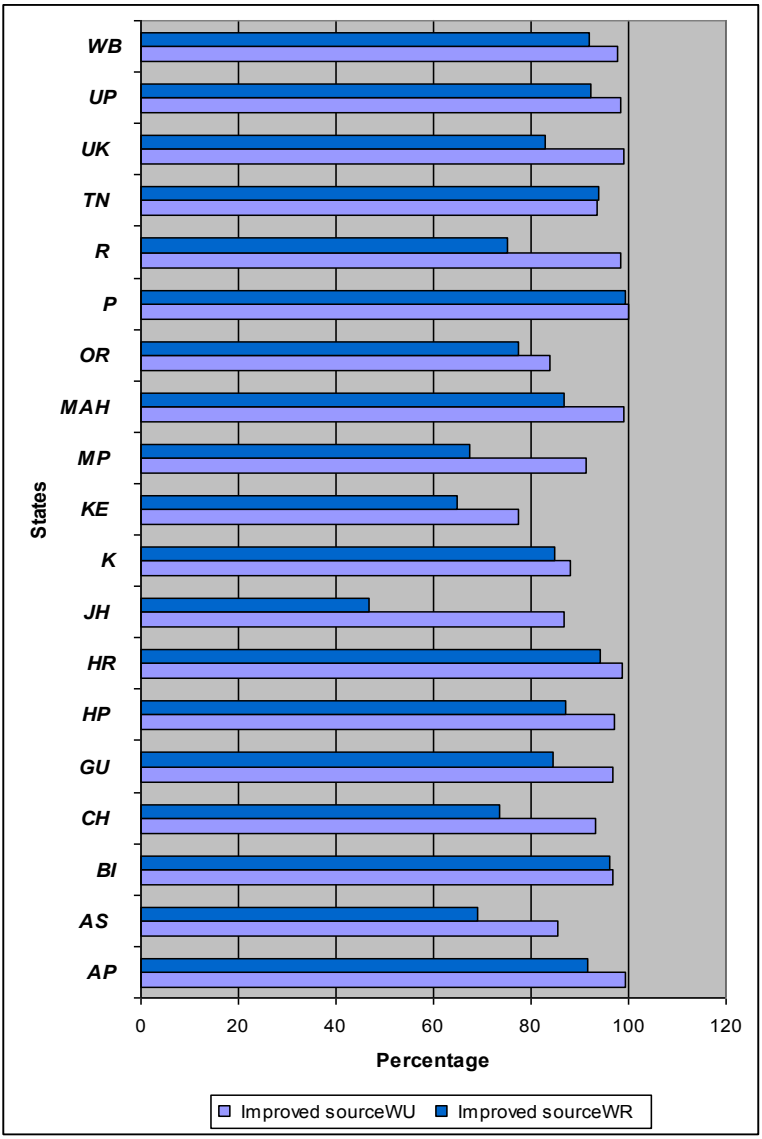
Chart 14: BPL Card Holders ((Rural vs. Urban)



Source: IIPS and Macro International. 2008.

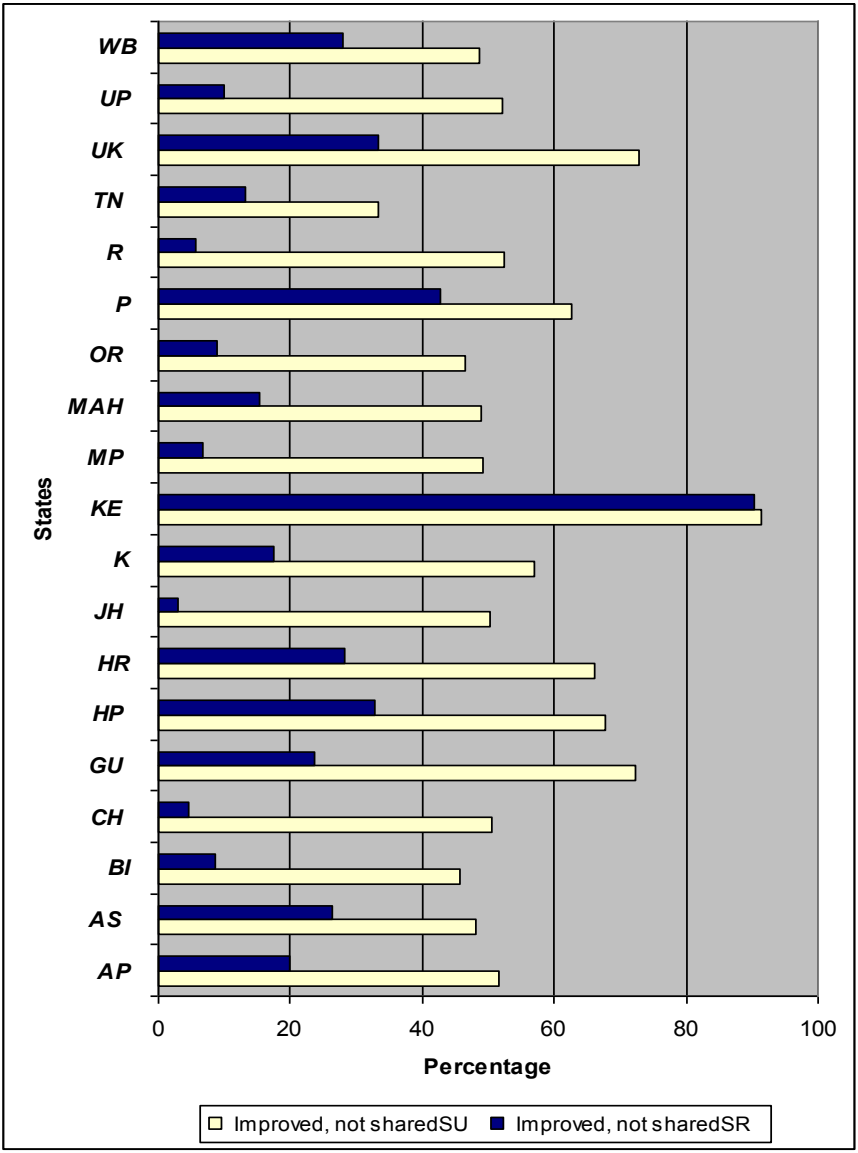
It should be noted that even the planning of basic resources like improved water supply and sanitation also goes in line with these distributions. As depicted in Charts 15 and 16, the improved sources of water supply are much below in rural areas relative to their urban counterparts in most of the states with some exceptions like Punjab and Tamil Nadu (in water supply) and Kerala (in sanitation). These differentials are low in water supply but in sanitation there is a glaring gap between rural and urban areas both in richer and poorer states (Charts 15 and 16). A similar observation holds true in regard to pucca hosing where except Kerala (with lower gap) most of the rural areas are having a much lower proportion of the pucca housing facility with a worse situation in poorer states like Assam, Bihar, UP, MP and Orissa (Chart 17). It is thus imperative that poorer sanitation and housing may have a definite adverse impact on mortality indicators which thus happen to be more in rural areas. Even though a direct intervention is being made through primary health system geared towards rural orientation and in recent years NRHM inputs meant particularly for poorer rural areas. A further noteworthy feature in this regard is that despite a liberalisation of insurance sector since 2001 and a plethora of individual health schemes/ health insurance schemes initiated in recent years the coverage in rural areas of these schemes is abysmally low and much lower than urban areas (Chart 18).

Chart 15: Improved Source of Water Supply (Rural and Urban)



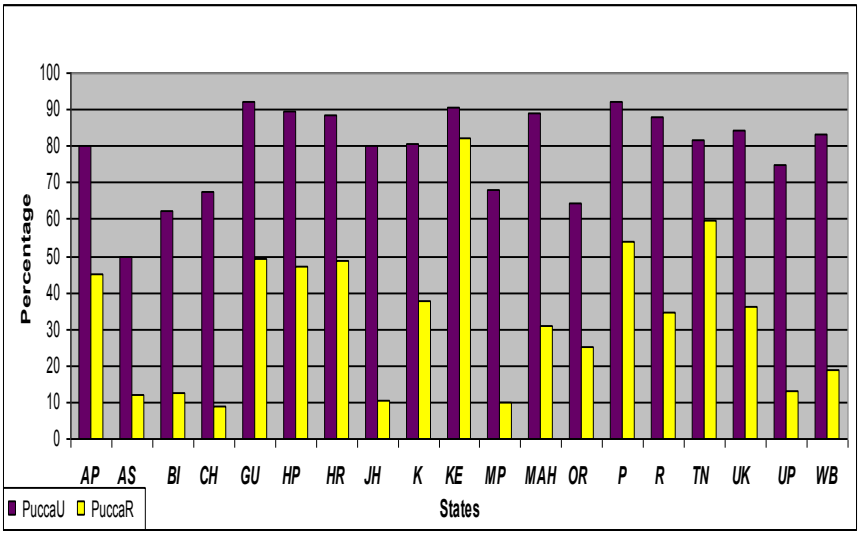
Source: IIPS and Macro International. 2008.

Chart 16: Improved Sanitation (Rural and urban)



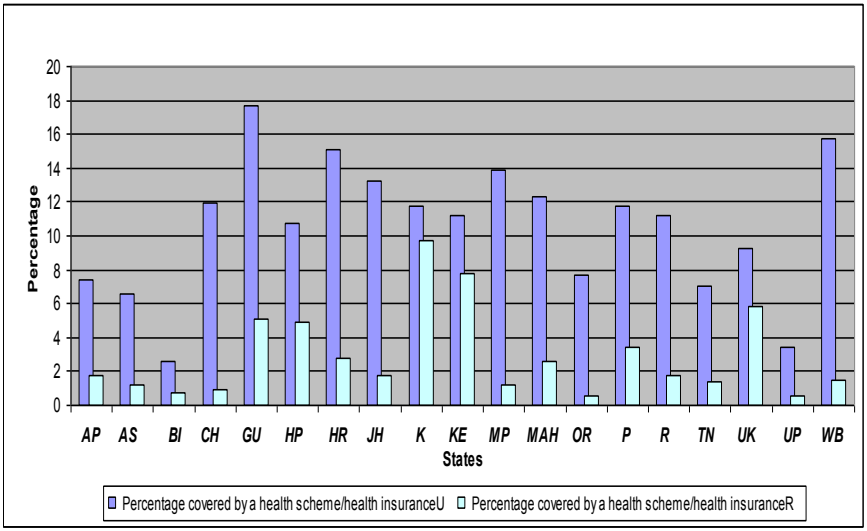
Source: IIPS and Macro International. 2008.

Chart 17: Pucca Housing (Rural and Urban)



Source: IIPS and Macro International. 2008.

Chart 18; Health Insurance/Scheme Coverage (Rural vs. Urban)



Source: IIPS and Macro International. 2008.

Table 5: Regression Results for Impact of Socio-Economic Variables (Rural)

Dependent Variable→ / Explanatory Variable\Statistic↓	RM3†	RM4†	RM5†	UWRURAL†	RUANMCHL†	RUANMWMN†
ED1F	0.131 (2.700*)	0.218 (3.250*)	0.232 (3.560*)	0.096 (2.130*)	0.200 (3.650*)	0.073 (1.930**)
ST	0.237 (3.510*)	0.124 (2.660*)	0.282 (3.910*)	-	-	-
Facility shared	-	0.412 (2.360*)	0.569 (2.680*)	-	-	-
Kachha	- -	-	-	-	-	-
Lowest	-	-	-	0.095 (2.840*)	-	-
Nuclear	-	-	-	-	-	-
Semkacha	-	-	-	-	-	0.035 (1.350)
Pseudo R^{-2}	0.280	0.239	0.351	0.205	0.178	0.067
Chi sqaure	30.620*	25.440*	38.290*	23.010*	19.440*	7.470**

† indicates logit model results of the respective dependent variable.

Table 5: (Contd..)Regression Results for Socio-Economic Variables (Rural)

Dependent Variable→ / Explanatory Variable\Statistic↓	Diabwmn	ASTHWMN	Goitrwmn	Diabtmen	Asthmmen	Goitrmen
Intercept	4176.57 (3.62*)	727.86 (2.41**)	138.02 (1.07)	2485.32 (3.84*)	-1421.32 (-1.30)	-1123.00 (-2.05**)
Hindu	-.457 (-2.20*)	-		-	-	-
Muslim	-	.429 (2.09***)	.632 (3.41*)	.537 (3.91*)	-	.680 (4.16*)
Pucca	-	-	-	-	-	.510 (2.70**)
Goitrmen	-	-	-	.324 (2.16**)	-	-
HHSize	-.514 (-2.47**)	-	-	-.442 (-3.45*)	-	-
Diabtwmn	-	.359 (1.75***)	-	-	-	-
BPL Card	-	-	.482 (2.60**)	-	-	-
Diabtmen	-	-	-	-	.934 (5.76*)	-
Frmanimal	-	-	-	-	.275 (1.699!)	-
ED2Man	-	-	-	-		.341 (1.82**)
R^{-2}	.294	.364	.465	.810	.649	.526
F Statistic and DF	4.547**, 17	6.14*, 18	7.95*, 16	25.11*, 17	17.62*, 18	7.67*, 18

Source: Estimated; *=1%, **=5%, ***=10%, != slightly below 10%

Table 6: Regression Results for Impact of Socio-Economic Variables (Urban)

Dependent Variable→ / Explanatory Variable\Statistic↓	Um3†	Um4†	Um5†	Uwturbn†	Uanchld†	Uanwmn†
ED1F	0.196 (2.720*)	0.241 (2.990***)	0.213 (3.040*)	0.208 (3.010*)	0.169 (2.480**)	-
Insurance	0.242 (1.910**)	-	-	-	-	-
Lowest	-	-	-	-	-	0.692 (3.410*)
Facility shared	-	-	-	-	-	0.164 (2.540*)
No transport	-	-	-	-	-	0.091 (1.990**)
Semkacha	0.205 (3.100*)	0.127 (2.430*)	0.149 (2.580*)	-	-	-
Pseudo R^{-2}	0.178	0.162	0.176	0.091	0.066	0.151
Chi sq.	19.380*	17.280*	18.740*	9.930*	7.220*	16.940*

† indicates logit model results of the respective dependent variable and values in the parentheses are Z values.

Table 6:(Contd…)Regression Results for Impact of Socio-Economic Variables (Urban)

Dependent Variable→ / Explanatory Variable\Statistic↓	Udbtwmn	Uathwmn	Ugtrwmn	Udbtmen	Uathmen	Ugtrmen
Intercept	4130.38 (4.01*)	-700.82 (-2.32**)	10767.55 (2.35**)	6225.29 (2.16**)		-3217.47 (-4.53*)
ED1F	-	-	-	-		
Improv	-	-	-.449 (-2.07***)	-.571 (-3.30*)		
No transport	-	.249 (3.03*)	-	-		.568 (4.25*)
Ownhouse	-	-	-	-	-	.571 (4.28*)
Mqtnet	-	-	-	-	-	-.268 (-2.15**)
Pucca	-	-	-	.568 (3.34*)	-	-
HHSize	-.565 (-3.48*)	-	-	-	-	-
Ugtrwmn	.493 (3.24*)	.751 (8.85*)	-	-	-	-
BPL Card	-	.235 (2.71**)	-	.404 (2.48**)	-	-
Diabtmen	-	-	-	-	.402 (1.93***)	.498 (4.11*)
OTCast					-.358 (-1.72!)	
Frmanimal	.378 (2.45**)	.207 (2.69**)	-	-	-	-
ED2Man	-	-	-	-	-	-
R^{-2}	.711	.898	.155	.547	.226	.752
F Statistic and DF	11.45*, 18	32.84*, 18	4.30***, 18	8.24*, 18	3.62**, 18	14.66*, 18

Source: Estimated; *=1%, **=5%, ***=10%, != slightly below 10%

Results of our regression analysis using logit and OLS are presented in Tables 5 and 6. Since mortality and other indicators like underweight children, anemia of women and children are given as per thousand or in proportions, we have used logit models for these

dependent variables and the results are presented in Tables 5 and 6[6]. Both for rural and urban areas we have used a set of 12 dependent variables. These include three mortality indicators namely IMR, CMR and UFMR. The other dependent variables represent nutritional deficiency or diseases for men and women separately. Thus nutritional disorders are represented by Underweight children[7], anemia of children and women separately and three environment related or life style diseases for males and females namely, Diabetes, Asthma and Goitre. Among the set of independent variables we used some 48 variables representing various socio economic aspects. These were used based on their statistical significance individually prior to selecting final equation which combined them after taking into account any multicollinearity. Thus in the set of rural sector results, 18 explanatory variables in different equations emerged as statistically significant. In urban sector results such variables were 21. Generally explanatory power has been satisfactory for our results which are depicted through R bar squared values in the Tables.

Results of our rural sector depict that mortality is highly positively influenced by lack of basic education of women with its coefficient ranging from .131 (for IMR) to .232 (for UFMR). An important aspect is positive impact of ST belonging for all these mortality indicators (Table 5). This indicates a lack of positive impact of various promotive and curative care for tribal areas. Lack of sanitation and proper housing facility seemed to have its positive impact on mortality either for IMR or other two mortality indicators (Table 5). It is further observed that nutritional deficiency as depicted by the results of underweight children and anemia of children and women are positively impacted by lack of basic education for females. Likewise belonging to a poor family (coefficient of lowest wealth index=.095) and poor housing condition (coeff=.035) are other important determinants of underweight of children

[6] OLS estimates may be biased and inefficient in case of discrete dependent variable and thus logit regressions are presented for such dependent variables.

[7] age to weight criteria using 2 standard deviation as given in NFHS 3 data .

and women anemia (Table 5). These results of mortality indicators thus reinforce the fact that rural poor are at a disadvantage in receiving fully the benefits of our health system. Lifestyle diseases like diabetes and asthma had an impact from religion and household size indicating that sometimes certain food habits owing to some community influence and overall bigger size of family leading to less careful trend towards individual health might have had an impact in the incidence of such diseases (Table 5).

The results of urban sector indicate lack of: female education, proper housing and insurance as important determining factors in influencing mortality (Table 6). The coefficient of lack of female education varies between .196 (for IMR) to .241(for UFMR). The coefficients of insurance and lack of proper housing vary between .242 (for IMR) and .127-.205 (for CMR and IMR) respectively (Table 6). These results of urban mortality in fact depict a disadvantageous situation caused by proper availability of adequate financial resources (lack of insurance) and prevalent condition of poor housing in poorer localities of urban areas. A further impact of poverty driven diseases particularly women anemia is also noted through these results for urban sector with an impact of belonging to a lowest wealth index family (coeff. .692), shared sanitation facility (.164) and no transport vehicle ownership (coeff. .091) (Table 6). An important determinant of diabetes and asthma is seen with the impact of household size(-.565 for diabetes of women), BPL status (both for men and women coeff. between .235- .404, women and men respectively) and ownership of farm animals (for daibetes women coeff. .378).

Thus our results are in line with other studies which indicate toward much better health in urban areas. For instance, in Colombia child malnutrition and infant mortality are much more prevalent in rural areas (Flores 2000). In Peru health indicators are two to four times better in urban areas than in rural areas. Generally higher income is found

positively correlated with better health, with the direction of causality clearly established from wealthier to healthier (Pritchett and Summers 1996). It has also been pointed out that sickness and poverty generally send households into poverty as debts are incurred for treatment or breadwinners are no longer able to work (WHO/UNICEF 2004, Bitrán, Giedion, Valenzuela, and Monkkonen 2003)[8]. In line with our findings, other studies also provide evidence that physical environment, including access to water and sanitation, exposure to environmental contamination, the level of cleanliness, and protection from the elements, is a key determinant of health outcomes (Bitrán, Giedion, Valenzuela, and Monkkonen 2003). The social environment, like the level of community integration, membership in social groups have been found to be inversely related with health (Kawachi and Kennedy 1997).

While poverty has a uniform impact on both the rural and urban people, it is emphasized that urban poor particularly in their health outcomes are influenced by a number of other factors since partly the urban population has better access to infrastructure and medical services and more money than the rural population yet the their physical environment are distinct from and have greater negative health impacts than those faced by their rural counterparts. A number of studies indicate that environmental pollution has a significant effect on the health of urban populations. It may be for instance an increase in airborne contamination (which is higher in cities) resulting in increased hospitalization due to respiratory illness and pneumonia (Gouveia and Fletcher 2000). In fact it is suggested that pollution has a disproportionately large impact on lower income populations in urban

[8] However, there is a very little consensus on the impact of these factors on health outcomes(Bitrán, Giedion, Valenzuela, and Monkkonen 2003). There is no consensus in the literature on the extent to which consumption of health services improves health outcomes (Bitrán, Giedion, Valenzuela, and Monkkonen 2003).Studies have shown public expenditure on health services to have a limited impact, possibly due to variations in the quality of expenditure and the importance of individuals' health-seeking behavior (Filmer, Hammer, and Pritchett 1997).

areas, but little research has been conducted on the issue (Bazzani 1995, Purohit, 2011). Evidence from UHRC indeed indicate that in India one in every ten children in slums do not live to see their fifth birthday. Only 42 % of slum children receive all the recommended vaccinations. Over half (56 %) of child births take place at home in slums putting the life of both the mother and new born to serious risk. Poor sanitation conditions in slums contribute to the high burden of disease in slums. Two thirds of urban poor households do not have access to toilets and nearly 40 % do not have piped water supply at home.

CONCLUSIONS

Our regression results thus indicate that both the factors namely, poverty and rural-urban belonging influence health demand and education also modifies the pattern of such demand as well as pattern of diseases. Combined with the health and education financing depicted in the earlier sections, overall human development pattern seems to have been influenced by poverty, inequality across rural and urban areas and inadequate financing efforts by the states for health and education. Within the states, a further analysis by us earlier at the district level in MP and West Bengal (poorer states) and Karnataka, Maharashtra and Punjab (richer States), for instance, further indicate that outcomes in health sector are being influenced by an inefficient utilization of limited budgetary resources due to various factors comprising of misallocation of funds across inputs, low productivity and local political bureaucratic hurdles (Purohit, 2010 a, b, c, d). Thus any financing strategy to human development aiming at reducing disparities should also take into account not only overcoming inadequacy but also inefficiency in allocation and utilization of health care inputs (Purohit, 2010).

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