Social Sector Expenditure and Attainments: An Analysis of Indian States

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Recognising the role of human capital formation and the need for social spending, the study, covering a sample of 15 non-special category states, examines the level and effectiveness of social sector expenditure in the field of education and health over the period 1985-86 to 2000-01. Empirical findings establish that public spending on education has been productive, though it has been more at the primary than at the secondary level of education. The relationship is stronger for poorer than non-poorer states. Female education is instrumental in enhancing both primary and secondary enrolments. The relationship between public spending and health outcome turns out to be weaker, though it is indicative more of inadequate than ineffective health expenditure. Infrastructure availability seems to have a significant influence in reducing infant mortality. State spending has played a less important role in case of health than education in narrowing down the gender and rural-urban disparties.

JEL Classification : H72, I20, I10

Key Words : Public spending, Education, Health

Introduction

'Investing in people' is now well recognised as the prime motive behind various development and poverty alleviation initiatives. At the international level, one sees several initiatives in the 1990s aimed at sustainable economic and social development, which have finally culminated in the shape of the United Nations Millennium Declaration of September 2000, setting out various developmental goals influencing the well-being of people. Education and health sector goals have been recognised as crucial components of the Millennium Development goals. The importance being attached to these two sectors by the

international community is associated with the changing perceptions about the desirability of human capital formation not only as a means, but also as an end in itself. The World Development Report 2003 also notes that one of the initiatives to promote sustainable development in a dynamic world is to empower underprivileged sections of population by increasing their access to education and health.

In recognition of the fact that economic prosperity, measured in terms of per capita income alone, does not always ensure enrichment in quality of life, the development strategy adopted in the Tenth Plan in India is also built on the need to exploit synergies between economic growth, desirable social attainments and growing opportunities for all. In line with this broad thinking, it is envisaged that the Government's role will clearly have to expand in social sectors.

Against the backdrop of the increasing importance being attached to human development both at national and international levels, an attempt has been made to analyse the present state of social sector development across states and to examine the effectiveness of public spending on social sectors *viz.,* education and health in terms of select human development indicators of various states. As social sector expenditure is supposed to have a bearing on quality of life of beneficiaries, the study is extended to cover some analytical issues in related areas.

With this broad objective, Section I presents a brief account of the need for public provision and subsidisation of education and health services. Section II brings out the comparisons across countries with respect to social expenditure and attainment indicators, in particular education and health. Earlier studies on the subject, both at the national and international level, have been glimpsed upon in Section III. Section IV offers an analysis of the pattern of expenditure on education and health across the Indian states. The subsequent two sections empirically analyse the impact of education and health expenditure on corresponding attainment indicators, both direct impact and the distributional impact, using data for Indian states. Section VII sets out the concluding observations.

Section I
Public Provision and Subsidisation of
Education and Health Services

Education and health services are the two crucial segments of the social sector that attract significant public expenditure with strong elements of subsidy. The role of public policy is supported on the premise that expansion of health care, education and social security can directly improve the quality of life, increase productivity of workforce, lead to higher growth and reduce poverty (RIS, 2002). In the literature, there is substantial talk of 'growth mediated' success *vis-à-vis* 'support led success' and the latter strategy is found effective and therefore recommended for the achievement of a better quality of life in terms of social indicators in developing countries.

Public provision of social services, particularly education is also considered as an effective instrument to promote equity by way of providing equality of opportunity to the masses. Further, disparities prevailing in education levels and health indicators between rich and poor and between urban and rural populations in several developing countries including India necessitate the need for public sector financing of education and health to take care of such disparities. The paper on Government Subsidies in Inida (1997) observed in this context that "social services, even though highly subsidised, may still be out of reach for the poor, because the component of private costs (transportation, books, medicines, etc.) may be prohibitively high". This underlies the basis for a pro-poor bias in public funding of social sector programmes to ensure that the targeted population is covered to the extent possible. As rightly observed by Reddy (2002), "The poor, the vulnerable and the underprivileged will continue to be the responsibility of national governments and hence of public policy." Dreze and Sen (2002) are also of the view that the promotion of education and health sectors should be seen as irreducibly social concerns, even when particular services are effectively provided through private channels.

Apart from the social and welfare concerns, the justification for state action in provision of education and health services is based on

public goods character of these services.[1] Theoretically, both education and health have large externalities leading to differences between social and private returns. It is well established that the dependence on market mechanism may not provide an optimal solution in such situations. Efficiency considerations, therefore, call for public intervention (Musgrave, 1996). Further, there is no guarantee of an equitable provision of these basic services under the market mechanism. The role of public sector in information provision in health sector itself is considered important due to asymmetry of information between users and providers of health services. Another reason put forward to justify public intervention is the principal-agent problem. Further, it is the peculiar nature of insurance markets for health care and the resultant consequences of inefficiency and inequity, which necessitate an increasing role of the government in health care and insurance.

The positive interconnections between health and education are well recognised.[2] Education in general and female education in particular is supposed to have positive effects on child health, schooling and fertility. Agnihotri (2002) points out that there is a threshold effect in the relationship between literacy and child population size. These interconnections between health and education sectors therefore assume importance from the point of view of policy formulation and implementation. Overall, public provision and subsidisation of education and health services to the masses and thus their empowerment is considered critical for human resource development in the overall development strategy of any country.

Section II
International Comparisons

Public policy has come to play an important role in education and health sectors the world over. International comparisons reveal that public spending on education and health accounts for a higher percentage of GDP in high income countries. In fact, public sector's role in health is most prominent in developed countries that are generally market-oriented. On the contrary, a smaller percentage of

health care is financed publicly in low income countries. This seems to be in contrast to the theoretical view that the appropriate state role in health sector is expected to be larger when poverty is widespread (Musgrave, 1996).

Interestingly, countries with almost same per capita income levels have also shown marked differences in terms of public policy intervention and achievement in education and health sectors. For example, within sub-Saharan Africa, substantial differences are observed across countries, attributed to factors like the impact of implementation of stabilisation and structural adjustment policies, prevailing macro-economic environment, administrative collapse, war, etc. (Appleton et al, 1996). The role of an active public policy is quite clear in East Asian Countries and also in China where public sector financing helped in laying down the initial endowments before allowing the market forces to play their role in social sectors[3] (Dreze and Sen, 2002).

A comparison of education levels across countries having similar initial positions, in some empirical studies, points out that their performance has varied over time. For example, China and India both faced problems of high levels of illiteracy in early 1950s but China has moved ahead of India in terms of elimination of illiteracy in the younger age groups. Comparing India *vis-à-vis* others with respect to education and health services have generally revealed low levels of public spending and also gaps in infrastructure leading to poor usage of financial support being extended to these sectors.

In India, public spending on education accounted for 4.1 per cent of GDP in 2000. At this level, India remained close to the middle income and many European countries (Table 1). The education sector in India has seen a number of policy initiatives taken by the Central Government in the 1990s although State Governments continue to be major spenders. There is no doubt that there has been an improvement in education performance indicators in general and higher and technical education in particular over the past years. Yet India remains behind other middle income and European countries with regard to educational attainment indicators. Further, India's present position is not considered good enough against the backdrop

**Table 1: International Comparisons-Expenditure on Health &
Education and Select Performance Indicators**

Group of Countries/ Country	Public Expend. on Education[4] (% of GDP) (2000)	Public Expenditure on Health		Gross Enrolment Ratio			Life expect-ancy at birth (2001)	Infant Mortality rate (2001)
		Percen-tage of GDP (2000)	Percen-tage of Total (1997-2000)	Pri-mary (2000)	Secon-dary (2000)	Terti-ary* (2000)		
			Public	Private				
Low Income	2.8	1.1	27.1	72.9	95	44	8	59	80
Middle Income	4.5	3.0	51.8	48.2	109	70	17	70	31
High Income	5.3	6.0	62.2	37.8	102	106	62	78	5
East Asia & Pacific	2.3	1.8	38.6	61.4	106	61	9	69	34
Europe & Central Asia	4.4	4.0	72.4	27.6	94	88	44	69	30
Latin America & Carib.	4.4	3.3	47.6	52.4	130	86	21	71	28
Middle East & North Africa	5.3	2.9	61.9	38.1	95	76	22	68	44
South Asia	2.5	1.0	20.8	79.2	98	48	10	63	71
Of which:									
India	4.1	0.9	17.8	82.2	102	49	10	63	67
Pakistan	1.8	0.9	22.9	77.1	75	..	..	63	84
Bangladesh	2.5	1.4	36.4	63.6	100	46	7	62	51
Sri Lanka	3.1	1.8	49.0	51.0	106	72	..	73	17
China	2.9	5.3	36.6	63.4	106	63	7	70	31
Sub-Saharan Africa	3.4	2.5	42.4	57.6	86	27	4	46	105
Europe EMU	4.8	6.7	73.4	26.6	104	107	52	78	4
US	4.8	5.8	44.3	55.7	101	95	73	78	7
UK	4.5	5.9	81.0	19.0	99	156**	60	77	6
Germany	4.6	10.6	75.1	24.9	104	99	46	78	4

Source: World Development Indicators, 2003.

* As per UNESCO's definition, tertiary education refers to post-secondary education regardless of whether it leads to an advanced research qualification or not.

** Includes training for the unemployed.

of sharp differences across states and persistence of large female-male and rural-urban disparities. This type of situation is often interpreted as a failure of state initiatives to bring about desired improvements in education performance indicators. It is also held that the strategy adopted for educational expansion has had limited spillover effects.

The share of public expenditure on health in GDP has remained much lower relative to international levels (around 0.9 per cent as compared to 1.1 per cent for low-income and 6.0 per cent for high-

income countries, Table-1). Further, the share of public expenditure to total health expenditure is also one of the lowest for India (around 18 per cent as against 36 per cent for Bangladesh, 36.6 per cent for China, 49 per cent for Sri Lanka, 27 per cent for low income and 62 per cent for high income countries). India's performance in terms of health indicators viz., infant mortality rate and life expectancy is not very impressive. This is attributed, among others, to an expensive hospital based curative strategy adopted for provision of health services in India as against low cost community based strategies preferred in China and Sri Lanka.

Section III
Review of Literature

At the cross-country level, the relationship between social sector expenditure and various social sector performance indicators has been analysed in many studies using cross/panel data regression analysis. Although higher public spending on these sectors is expected to show up an improvement in social indicators, this is not empirically established in all studies. The results vary widely and tend to support either growth-led or direct intervention strategies to address the human development issues particularly in the context of developing countries. While in the case of health sector empirical results vary from no relationship (Filmer and Pritchett, 1999) to weak relationship (Verhoven et al, 2002) between health spending and outcome, the education sector results show weak to strong relationship (Verhoven et al, 2002) between education spending and performance indicators. Per capita income remains an important determinant of both health and education attainment indicators (Baldacci et al, 2002). However, the relationship between public spending on health care and the health status of the poor is observed to be stronger in low-income countries than high income countries (Gupta et al, 2001).

The empirical work in India has looked at several aspects of social sector expenditure extending from a simple analysis of trends in expenditure at the Central and State levels to micro level as well as some technical issues. Some studies (Shariff et al, 2002) have included

expenditure on poverty alleviation programmes as an important component of social sector expenditure. The focus of empirical analysis in some cases has been on quality of public education and health services in influencing the utilisation of these services. While the impact of social sector expenditure on human development has generally been recognised, there are only a few studies that have actually examined the issue empirically for India. Prabhu and Chatterjee (1993) viewed social priority and human expenditure ratios as indicators of the government's commitment to the cause of human development. They tried to relate these indicators to the levels of development of physical infrastructure as well as government expenditures during 1983-86 and 1988-91[5] using the principal component analysis method. Infrastructure development was found to have a significant influence on health indicators, while it was not so for educational performance indicators. Recognising the role of human capital accumulation for growth, a study using data for Indian states (1980-97) reveals that human development policy has a significant impact on economic growth (Pradhan and Abraham, 2002).

Empirical studies in the Indian context also reveal inter-state as well as intra-state (across districts) differences and rural-urban and male-female disparities in health and education indicators (Sipahimalini, 2000). It is generally viewed that per capita income is an important determinant of educational achievements but it fails to explain differences in literacy rates across states with comparable levels of income. This is attributed to differences observed among states in public commitment to the provision of educational facilities. The success of Himachal Pradesh and Kerala on the educational front is often highlighted to establish the role of active public policy in these states (Dreze and Saran, 1999).

Section IV

Government Expenditure on
Education and Health in India

The social sector[6] involves major responsibility in respect of expenditure liability on State Governments although in view of significance and importance attached to this sector, the Central

Government remains involved either directly or indirectly by way of both financial and directional/policy support being extended to State Governments enabling them to extend such services efficiently and effectively to the general public.

A quick look at the social sector plan outlays reveals that education continues to receive priority attention. During the Ninth Plan period, education sector expenditure aggregated to Rs.51,343 crore, accounting for 29.3 per cent of total public sector expenditure on social services. In contrast, the share of plan outlay on 'medical and public health' in total social services expenditure during the Ninth Plan stood at only 9.9 per cent.

In view of the importance of education sector in overall development strategy, an important initiative has been taken at the

Table 2 : Plan Outlays of Centre, State and Union Territories on Social Sectors

Plan	Education	Medical and Public Health	Social Services
First Plan (1951-56)	149.0	65.2	472.6
Second Plan (1956-61)	273.5	140.8	854.8
Third Plan (1961-66)	588.7	225.9	1491.8
Annual Plans (1966-69)	306.8	140.2	975.9
Fourth Plan (1969-74)	774.3	335.5	2985.2
Fifth Plan (1974-79)	1710.3	760.8	6833.9
Annual Plan (1979-80)	263.0	223.1	1967.5
Sixth Plan (1980-85)	2976.6	2025.2	15916.6
Seventh Plan (1985-90)	7685.5	3688.6	34959.7
Annual Plan (1990-91)	2316.5	1040.8	9606.6
Annual Plan (1991-92)	2599.0	924.8	10298.7
Eighth Plan (1992-97)	21598.7	8137.6	88806.6
Ninth Plan (1997-2002)[7]	51343.2	17379.7	175214.6
Annual Plan (1997-98)	7656.6	2641.5	26867.2
Annual Plan (1998-99)	9684.1	5411.9	38735.3
Annual Plan (1999-2000)	10018.4	3568.7	37013.9
Annual Plan (2000-01)	17644.5	4346.6	45710.8
Annual Plan (2001-02)	6339.6	1411.0	26887.4

Source: Indian Public Finance Statistics, various issues, Government of India.

Central Government level to supplement funds available for this sector through extra budgetary means by setting up a registered society named 'Bharat Shiksha Kosh'. The objective is to mobilise resources by way of contributions, donations or endowments from individuals, Central and State Governments, Non Resident Indians and People of Indian Origin for various educational purposes.

Notwithstanding the Centre's efforts, it is the State Governments that account for a majority share (of more than 80 per cent) of the social sector spending. Hence, a detailed analysis of trends in state government spending is of significance. For the purpose of analysis, we have considered actual spending of 15 non-special category states from 1985-86 to 2000-01. It is important to note here that our analysis is limited to revenue expenditure only. Though capital expenditure constitutes nearly 17-18 per cent of total expenditure of states, its share in education lies between 0.2 per cent and 1.4 per cent for most states except Goa, for which it is around 3.6 per cent. Capital expenditure accounts for a still smaller proportion in the case of health expenditure.

Table 3: Trend in Education and Health Expenditure across States

State	Growth in GSDP per capita p.a. (1985-86 to 2000-01)	Education expenditure as % of GSDP		Health expenditure as % of GSDP		Change in real expenditure per capita p.a. (1985-86 to 2000-01)	
		1985-86	2000-01	1985-86	2000-01	Education	Health
Andhra Pradesh	5.9	3.5	2.7	1.2	0.7	3.1	1.2
Bihar	3.2	5.9	8.7	1.5	1.5	7.7	3.5
Goa	10.1	5.0	3.3	1.8 *	1.1	4.2	3.9
Gujarat	5.9	3.4	3.3	0.8	0.7	5.5	3.6
Haryana	3.8	2.3	2.5	0.8	0.5	4.5	-0.5
Karnataka	8.2	3.3	3.3	1.2	0.7	8.3	2.5
Kerala	5.9	5.5	3.8	1.5	0.8	2.0	0.4
Madhya Pradesh	5.8	2.8	3.8	1.0	1.0	10.5	5.7
Maharashtra	6.3	2.7	3.6	1.6	0.5	11.1	-2.2
Orissa	1.4	2.9	4.8	1.1	1.0	7.1	1.0
Punjab	3.5	2.5	2.7	0.9	0.9	4.4	3.3
Rajasthan	4.8	3.7	4.2	1.2	1.0	6.4	2.5
Tamil Nadu	6.8	3.6	3.2	1.7	0.7	5.4	-1.0
Uttar Pradesh	3.0	2.8	3.4	1.0	0.6	4.9	-0.7
West Bengal	5.4	2.8	3.3	1.1	0.8	7.3	3.1

Note: For data source see Annexure IV * for 1986-87.

(a) Public Education and Health expenditure across states[8]

State government policy initiatives have given due focus to education as is evident from the fact that in 11 out of 15 states, the rate of growth of real expenditure per capita per annum almost matched or exceeded the rate of growth in GSDP per capita per annum during the period 1985-86 to 2000-01 (Table 3). Resultantly, the ratio of education expenditure to GSDP in these states moved up.[9] The states, which deviated from this pattern, included Andhra Pradesh, Goa, Kerala and Tamil Nadu. Of these, Goa, Tamil Nadu and Kerala could still maintain relatively higher per capita education expenditure due to their relatively higher base level expenditure.

Health has remained a low priority area for most states. Health expenditure as a percentage of GSDP has remained not only low but also declined in 11 out of 15 states. In 2000-01, the ratio remained in the range of 0.5 per cent to 1.5 per cent for the states under review. Further in 4 states, viz., Haryana, Maharashtra, Tamil Nadu and Uttar Pradesh, real expenditure on health per capita per annum exhibited negative growth rates.

(b) Ranking of states with regard to per capita expenditure on education and health

Observed trends (Table 4) reveal the following:

- In the case of both health and education, the last four positions kept shuttling between the states of Bihar, Madhya Pradesh, Uttar Pradesh and Orissa and there was no substantial change in their ranking during this period.

- Kerala and Punjab have remained among top four states in terms of per capita expenditure during this period for both health and education.

- While the ranking of Maharashtra has improved in terms of per capita expenditure on education, the state has seen a substantial fall in its ranking for health expenditure.

- Haryana has seen a deterioration in its ranking for both the sectors.

- There has been a slight improvement in ranking of Rajasthan and Karnataka in the case of education expenditure and of Rajasthan, West Bengal and Andhra Pradesh in the case of health expenditure.

Table 4: Ranking of states in terms of per capita expenditures on education and health #

Ranking of States	Education Expenditure		Health Expenditure	
	1985-86	**2000-01**	**1985-86**	**2000-01**
From top				
1.	Kerala (148.8)	Maharashtra (969.9)	Maharashtra (67.3)	Punjab (247.0)
2.	Gujarat (124.7)	Kerala (818.7)	Tamil N. (49.6)	Kerala (181.8)
3.	Punjab (124.4)	Punjab (774.5)	Punjab (44.1)	Tamil N. (156.7)
4.	Maharashtra (113.0)	Gujarat (720.0)	Kerala (40.1)	Gujarat (149.2)
From bottom				
1.	U.Pradesh (63.3)	U.Pradesh (368.6)	Bihar (16.8)	U.Pradesh (68.9)
2.	M.Pradesh (66.0)	M.Pradesh (458.3)	U.Pradesh (23.1)	Bihar (86.1)
3.	Bihar (66.8)	Orissa (470.7)	M.Pradesh (21.4)	Orissa (96.5)
4.	Orissa (69.1)	Bihar (482.8)	Orissa (25.5)	M.Pradesh (120.3)

Figures in brackets indicate per capita expenditures in Rupees.

Note: The state of Goa has been excluded, as comparable data was not available for all the years.
For data source see Annexure IV.

- There has been no substantial change in the gap in expenditure on education and health between the highest and lowest spending state. The ratio of highest to lowest spending state remained close to 2 in the case of education while it declined in the case of health from 4.0 in 1985-86 to around 3.6 in 2000-01.

(c) Composition of education expenditure

State-wise details of composition of education expenditure reveal a bias in favour of primary and secondary school spending with the latter turning out to be more important than the former in Goa, Haryana, Punjab and West Bengal (Table 5), which can be explained in terms of higher primary enrolment figures for these states and the need to do more in the area of secondary school education. At the Central Government level, however, primary education expenditure remains the predominant component of total expenditure on education.

(d) Recoveries from education and health

The recoveries from education and health sectors (includes medical and public health) by way of user charges have generally remained low and account for small proportions of corresponding revenue expenditure for most states. The ratio of recoveries to expenditure on revenue account is particularly lower for education

Table 5 : Sectoral Composition of Expenditure on Education-State-wise details

(in per cent)

State	1985-86			2000-01		
	Primary	Secondary	Others*	Primary	Secondary	Others*
Andhra Pradesh	45.88	28.57	25.54	44.28	25.47	30.25
Bihar	61.37	20.19	18.45	68.67	18.41	12.92
Goa	32.26	47.89	19.84	27.68	51.75	20.57
Gujarat	58.45	27.48	14.06	56.96	29.90	13.14
Haryana	40.69	39.42	19.89	38.91	40.14	20.95
Karnataka	53.00	26.93	20.07	48.36	27.84	23.80
Kerala	50.97	29.65	19.37	47.15	31.86	20.99
Madhya Pradesh	61.66	19.96	18.37	63.47	17.03	19.50
Maharashtra	44.82	38.29	16.89	43.68	35.88	20.44
Orissa	51.38	26.91	21.71	60.58	21.20	18.22
Punjab	34.33	48.38	17.28	29.34	56.76	13.90
Rajasthan	52.14	34.31	13.54	57.66	32.45	9.89
Tamil Nadu	51.95	26.04	22.01	43.46	36.71	19.83
Uttar Pradesh	49.46	34.73	15.80	56.96	31.56	11.48
West Bengal	39.81	39.19	21.00	33.54	45.51	20.95

Source: Budgeted Expenditure on Education,Department of Education, Ministry of Human Resource Development, various issues.

* Includes adult education, technical education, university/higher education and others.

Table 6: Recoveries from Education and Health Sectors

State	Education recoveries as % of revenue expenditure on education		Health recoveries as % of revenue expenditure on health	
	1985-86	2000-01	1987-88**	2000-01
Andhra Pradesh	2.40	3.13	3.09	2.47
Bihar	0.74	0.47	2.95	2.24
Goa	0.38*	0.69	4.22	6.04
Gujarat	1.97	1.04	8.52	6.52
Haryana	4.30	1.64	8.21	9.17
Karnataka	2.48	1.14	1.54	3.79
Kerala	4.14	1.72	5.95	3.56
Madhya Pradesh	0.76	0.48	2.39	1.33
Maharashtra	0.83	0.34	6.36	5.52
Orissa	1.84	1.14	3.00	2.83
Punjab	1.27	0.56	5.53	5.06
Rajasthan	0.73	0.76	3.24	2.22
Tamil Nadu	1.83	1.22	5.85	6.36
Uttar Pradesh	1.41	2.90	3.86	2.85
West Bengal	0.57	0.39	10.03	3.87

Note: For data source see Annexure IV, * For the year 1987-88, ** Data for 1987-88 has been used as comparable information for all states for the earlier period is not available.

(less than 1 per cent for certain states) as compared to health. Further, for 11 out of 15 states, the ratio has declined for both education and health sectors in 2000-01 as compared to 1985-86.

Section V
Link between Social Spending and Attainment-
Panel Data Evidence

The empirical analysis is done to examine whether public spending has been productive in the sense that whether increased social outlays have been reflected in improved social indicators. The analysis is done for the 15 non-special category states for which data is available on all the chosen indicators over the period 1985-86 to 2000-01. For the state of Goa, data on health variables are not available. Hence, the health care analysis is restricted to the remaining 14 states.

V.1. The Choice of Variables

A wide range of social indicators is available to gauge the performance of public spending. Also, in addition to the policy variable *viz.* public spending, a number of other variables are known to determine the social outcome such as the economic development of the state, the social infrastructure availability in the state, the socio demographic conditions, the efficiency in resource use, initial levels of social attainment, etc. Annexure I lists out the whole range of variables that have been used in the literature either individually or in combination. The selection of variables in our analysis has been based on two factors: first, variables, which have been most frequently used by other empirical studies for inter-state and inter-country comparisons; secondly, variables for which reasonably upto date time series data are available. Based on the above considerations, listed below are the variables that have been chosen for our analysis:

1.   Social Attainment Indicators- Gross Enrolment Ratio (GER *i.e.,* number of students enrolled as a percentage of total number of school age persons). Both Primary (in the age group of 6-13 years) and Secondary (14-18 years) enrolment ratios are used as education attainment indicators. Infant Mortality Rate (IMR) is used as health attainment indicator.

2.   Social Spending- Statewise expenditure (revenue account) on education and health as a percentage of GSDP has been taken.

3.   A set of control variables that are known to affect the relation between 1 and 2.

- Extent of economic development of the state- NSDP per capita at constant prices is used as a proxy for this for both education and health.

- Level of development of physical infrastructure of the state- No. of schools per thousand population and No. of hospitals per 100 square km. are used as infrastructure proxies for education and health regressions, respectively.

- Socio demographic factors- Total Fertility Rate (TFR) and share of girls in secondary enrolment are used as proxies for health and education analysis, respectively.

- Other specific indicators- No. of beds per thousand population and Pupil-Teacher ratio (capturing the probable impact of literacy on health) has been used for health regression while only the latter has been used for education.

V.2. The model

The following regression equation is estimated using panel data
$Y_{it} = f(E_{it}, GSDP_{it}, X_{it})$ …………………… (1)
where Y denotes social indicator

    E denotes social sector spending

    GSDP is defined in per capita terms

    X is the vector of other control variables

    i denotes states in the sample

    t denotes time period.

Apart from the linear specification, two other specifications have been used to estimate the above relation:

1.   Log linear (log-log or double log) specification where all variables are in logarithmic form.

2.   Linear log (lin-log specification) where only independent
      variables are in logs.

Instead of going into the debate as to which functional form to use,
we have taken the functional forms used frequently in the literature to
examine such relationships, especially at the cross country level. [10,11]

In a heterogenous cross section analysis such as this,
heteroscedasticity could be a major problem. To take care of that as
can be seen, most variables have been normalised. Further, both
dependent and independent variables have been quite frequently
transformed into logarithms to scale down the variation. Nevertheless
some heteroscedasiticity could still persist in a sample of
heterogenous group of states. Greene's procedure provided in
LIMDEP econometric software for correcting the OLS covariance
matrix is used in the present exercise to correct for any potential
heteroscedasticity.

Since the data set pools observations across 15 states and over 16
periods of time, controls for state and time dimensions have been added.
With our prime objective being analysing the variations across states,
each state is considered as a separate unit and in case of time, a time
dummy kind of variable is introduced, which takes only two values, 0
for pre 1991-92 and 1 for post 1991-92 period.

V.3. Estimations and Inferences
V.3.1 Education Regression

Equation (1) is estimated using two measures of education
attainment: (a) Gross enrolment ratio in primary and secondary
education and (b) Gross enrolment in secondary education. Results
are reported in Tables 7 and 8.

V.3.1.1 Primary and Secondary Enrolment

It is observed that with gross primary and secondary enrolment as
the dependent variable, both public spending and per capita income
coefficients are found to have signs that are consistent with our
expectations. The significance level of per capita income coefficient is,

however, lower. It is also noticed that the role of per capita income relatively increases for secondary education as compared to primary education.

Of the control variables, the share of girls in secondary enrolment turns out to be important in explaining the differences in enrolment rates across states reflecting the important role that female literacy can play in improving the education outcomes. The infrastructure variable, 'Number of Schools for general education' though correctly signed demonstrates low significance levels. However, one may not rule out the importance of informal (out of school) methods of teaching, more prevalent at the primary level, which have not been captured by the schools data. Surprisingly, the pupil-teacher ratio is significant with a positive sign. A possible reason, which is very often cited in Indian case, is that in the post independence era, though the number of educational institutions has increased significantly, the utilisation of these educational facilities has also increased resulting in higher pupil-teacher ratio. Further higher enrolment indicates the pressure on educational institutions. Hence, there is a need for opening more schools for taking care of demand side and improving the quality of education at the same time.

Table 7 : Gross Primary and Secondary Enrolment - Panel Regression Results

	Linear		Lin-Log		Log-Log	
	(1)	(2)	(1)	(2)	(1)	(2)
Constant	19.4**	9.87	-74.5**	-78.2**	.78***	.74***
State spending	2.4***	2.98***	10.7***	11.7***	.73E-01***	.77E-01***
NSDP	.33E-02	.56E-03**	10.9	7.8	.10**	.83E-01*
Schools	.11***	.67E-01**	2.14	.4E-01	.17E-01	.13E-02
G-Share	.25E-01	.41***	5.08	29.7***	.38E-01	.21***
Pupil Teacher ratio	.60***	.49***	50.11**	38.4****	.31	.24***
N	154		154		154	
F-value	94.2		86.35		92.94	
p-value	.00		.00		.00	
Adjusted R square	.92		.91		.92	
	FE	RE	FE	RE	FE	RE

***, ** and * indicate significance at 1, 5 and 10 percent; FE: Fixed Effect, RE: Random Effect
Fixed effect allows us to account for the presence of heterogeneity or differences in behaviour across individuals. The fixed effect approach takes α i to be a group specific constant term (and assumed to be correlated with the included variables) in the regression model that embodies all the observable effects for that group. The term fixed implies that it does not change over time. The random effect approach assumes individual heterogeneity to be uncorrelated with the included variables and specifies a group specific random element.

This model is able to explain more than 90 per cent of the variation in primary and secondary enrolment rates in a two-dimensional set up. The F-statistic for all regressions is statistically significant at the 1 per cent level.

V.3.1.2 Secondary Enrolment

Next we take the gross secondary enrolment ratio as the dependent variable with all the independent variables remaining the same so as to enable comparability with earlier analysis.[12] Results are clearer in this case. All variables are found to be correctly signed (even pupil-teacher ratio) though the significance levels of state spending and pupil-teacher ratio remain lower. The infrastructure index improves its significance level relative to the earlier regression though it still continues to remain low, indicating that education is more demand determined. In this context, the quality of services being offered in the existing infrastructure also plays an important role. Considering the case of Kerala, its rank in terms of infrastructure availability is not very high, yet with respect to education outcomes its results have been the best. This finding reinforces the earlier findings that mere setting up of schools is not an end in itself. What is more important is the efficiency/quality of services being rendered in these schools. With limited resources available with the states, it is important that whatever amount is spent on this sector, it should be targeted at the end, not at the means.

In the case of only secondary enrolment regression, the explanatory variables account for more than 80 per cent of cross-state variations in education attainment. The F-statistic for all regressions is statistically significant at the 1 per cent level.

One interesting result that emerges is that while state spending is a very important determinant in the case of primary education, its importance gradually fades out as we move on to secondary education where the per capita income turns out to be a more important determinant of education outcome measured in terms of enrolment ratio. One probable reason could be the fact that the expenditure on education here refers to only public spending ignoring the possible impact of private expenditure, which is more important at the secondary level.

Table 8: Gross Secondary Enrolment - Panel Regression Results

	Linear		Lin-Log		Log-Log	
	(1)	(2)	(1)	(2)	(1)	(2)
Constant	5.04	1.19	-73.2**	-51.6*	.98E-01	.34E-01
State spending	1.01	1.3**	.63	.37	.37	.22
NSDP	.12E-02***	.12E-02***	27.6***	17.2***	.30**	.15
Schools	60.7**	32.2*	5.1	5.9*	.98E-01	.98E-01
G-Share	.23	.37***	14.2	29.5***	.38*	.63***
Pupil Teacher ratio	-.8E-01	-.8	-13.3	-16.0*	-.21	-.24
N	154		154		154	
F-value	53.3		49.71		25.52	
p-value	.00		.00		.00	
Adjusted R square	.86		.85		.74	
	FE	RE	FE	RE	FE	RE

***,** and * indicates significance at 1, 5 and 10 percent FE: Fixed Effect, RE: Random Effect

V.3.1.3 Regional and Inter-temporal effects

Looking at the fixed effect (FE) coefficients, one observes that FE intercept coefficient is markedly significant for nine out of 15 states in the case of first regression with primary and secondary enrolment as the dependent variable indicating the presence of some state specific variables. For the states of Andhra Pradesh, Bihar, Orissa, Rajasthan and U.P, the coefficient is significant with a negative sign indicating that the average enrolment in these states is lower than all states average. For Kerala, Goa, Tamil Nadu and Maharashtra, it is significant with a positive sign indicating that the average enrolment is higher than all states average.

In the case of second regression with only secondary enrolment as the dependent variable, the FE intercept coefficient is significant for only four out of 15 states. For the states of Andhra Pradesh and Orissa, the coefficient is significant with a negative sign indicating that the average enrolment in these states is lower than all states average. For Kerala and Tamil Nadu, it is significant with a positive sign indicating that the average is higher than all states average. The success of these states, especially Kerala is very often associated with an early public commitment to provision of educational

services together with complementarity between state intervention, the market mechanism, and co-operative action.[13]

The time dummies are generally insignificant revealing no pattern in case of both primary and secondary enrolment ratios. The intertemporal effect exhibits significance only for secondary enrolment regression in linear form. The coefficient in this case for pre 1992 is significant with a negative sign and post 1992 is significant with a positive sign indicating that secondary enrolment has picked up across states over the post 1992 period.

V.3.1.4 Poor States vs. Non-Poor States

To examine the impact of spending on low income countries, Gupta, Verhoven and Tiongson (2001) in their study have classified the countries in their sample into two categories based on whether they are eligible for assistance from the World Bank and the IMF under the IDA and PRGF facility or not[14]. We have divided the 15 states into two categories- poor and non-poor - based on whether their per capita NSDP at constant prices for 2000-01 is above/below all-India average and examined the same relationship. This provides an indication of the differences in the effectiveness of public spending for poor *vis-a-vis* non-poor states. Table 9 provides the public spending coefficients separately for poor and non-poor states, as obtained from linear regressions, with all other variables remaining the same.

Two findings are noteworthy. First, in case of enrolment at primary level, the coefficient of public spending is significant for both the categories, with the coefficient being higher for poor states as compared to non-poor. This implies that public spending has a more important role to play in enhancing primary enrolment for poor states as compared to non-poor states. Second, in case of secondary enrolment, results show the absence of a statistically significant association between spending on education and enrolment for the poor states. Public spending coefficient is, however, positive and significant for non-poor states. Even if it is admitted that private spending is relatively more important at

secondary education level, the above result could be attributed to inefficiencies in the provision of services and poor targeting in the poorer states that weaken the impact of pubic spending on education.

Table 9 : Public Spending and Enrolment- Poor vs Non-Poor States

Enrolment	Poor States	Non-Poor States
Primary Enrolment		
Coefficient	3.0**	2.46***
Adjusted R square	0.63	0.77
N	90	105
Secondary Enrolment		
Coefficient	-0.37	1.5**
Adjusted R square	0.63	0.84
N	66	81

***,** and * indicates significance at 1, 5 and 10 percent

V.3.2 Health Regression

The findings of health regressions are reported in Table 10. Public spending on health care is clearly negatively associated with mortality rate, although not always at statistically significant levels. Per capita income is relatively more important vis-à-vis state spending in influencing health outcome, its coefficient being significant in all regressions. This is in line with the conclusion arrived at by Filmer and Pritchett (1999) for a data set comprising of both developed and developing countries and by Musgrave (1996). Also as expected, TFR moves in the direction of IMR and quite significantly. Of the two infrastructure variables, 'number of hospitals per 100 square km.' turns out to be more significant than 'number of beds per lakh population' of the state. Pupil-teacher ratio does not perform, as one would expect. Most of the time it has a negative sign although it is not significantly different from zero in statistical terms. Baldacci et al (2002) in their study have also observed low significance for pupil-teacher ratio.

Table 10: Infant Mortality Rate - Panel Regression Results

	Log-Log		Lin-Log	
	(1)	(2)	(1)	(2)
Constant	2.8***	2.7***	184.9***	180.4***
Public Expenditure on health	-.47E-01	-.6E-01*	-11.9	-15.56*
NSDP per capita	-.31***	-.28***	-39.66**	-38.56***
TFR	.46***	.56***	82.1***	98.1***
Hospitals per 100 sq.km.	-.6E-01**	-.71E-01***	2.14	-1.12*
Beds per lakh population	-.38E-01	-.48E-01	-3.9	-6.4
Pupil Teacher Ratio	-.79E-03	.39E-01	3.87	0.56
N	154		154	
F-value	219.46		114.68	
P-value	.00		.00	
Adjusted R square	.96		.93	
	FE	RE	FE	RE

***,** and * indicates significance at 1, 5 and 10 percent FE: Fixed Effect, RE: Random Effect

The income elasticity of infant mortality obtained in log-log regression is comparable with earlier estimates. Studies have shown that this elasticity lies between -0.2 to -0.4 for developing and transition economies.[15] Income elasticity in our sample of states turns out to be around -0.3.

For a cross country analysis, Gupta, Verhoeven and Tiongson (2002) have tried to take into account the decreasing returns to scale in the improvement of health by constructing a separate index.[16] Strictly speaking, this logic does not hold for Indian states, as most of them perhaps have not even reached the critical minimum as far as health attainment is concerned.

At the cross-country level, there are studies, which have pointed out that health care spending has differential impact on health status in low/high income countries (Gupta, Verhoeven and Tiongson, 2001)[17] The same was tried for Indian states based on whether their per capita income for 2000-01 is higher/lower than the all-India average. No such result was observed for states with high per capita income. State spending exhibits low significance for both low and high income states. Interestingly, the role of income substantially rises for the high income states, income elasticity being higher at 0.42.

V.3.2.2 Regional and Intertemporal effects

Looking at the FE coefficients, one observes that it is markedly significant for the states of Bihar, Kerala, Madhya Pradesh and Orissa for all functional forms. This indicates the presence of some state specific variables. For Madhya Pradesh and Orissa, the coefficient is significant with a positive sign indicating that the average mortality rate in these two states is higher than all states average and for Kerala and Bihar, it is significant with a negative sign indicating that their average mortality rates are lower than all states average.

The intertemporal effect has also been quite significant. For both functional forms, the coefficient for pre 1992 is significant with a positive sign and post 1992 is significant with a negative sign indicating that IMR has declined consistently across states over the period under review.

V.3.3 Rank Correlation Co-efficients

Table 11 : Rank Correlation between Social Expenditure and Human Development Index

Correlation Between	1991	2001
HDI and social expenditure	0.90	0.90
HDI and Education Expenditure	0.93	0.84
HDI and Health Expenditure	0.81	0.82

Note: Social, education and health expenditure are per capita expenditures in real terms for 1990-91 and 2000-01.

To see how social expenditure affects human development, we have calculated simple rank correlation coefficients between HDI ranking of the state as given by Planning Commission in its National Human Development Report 2001 and the per capita real expenditure of different states on social services. It is observed that the HDI and social expenditure are strongly positively correlated. Further, disaggregated analysis reveals that the rank correlation coefficients

between HDI and two other components of social expenditures, namely, education and health also turn out to be high. Of the two, education expenditure seems to be playing a more important role than health expenditure. The role of education in human development is well recognised and this finding further reinforces earlier findings.

Section VI
Distributional Effects of Social Spending

This section makes a preliminary attempt to explore whether increased education spending has had some impact on the inequality levels within the sector.[18] An appropriate way of testing this would be to see the impact of education expenditure on enrolment ratios for different income groups. However, because of non-availability of data on distribution of social indicators by income quintiles, this kind of analysis has not been attempted in the Indian context. At the cross-country level, a few studies (e.g., Bidani and Ravallion, 1997) have attempted to tackle this ecological inference problem by decomposing social indicators income group-wise with a view to analysing its impact on poor vis-à-vis non-poor. These studies reveal that the poor are more strongly affected by public spending on health care in comparison with the non-poor. This is said to be happening logically due to the fact that the better-off have the capacity to provide for and also substitute private for public health spending. This can be an area for future research using the state-wise social outcome data. The present study has looked at the problem from a slightly different angle - "whether social spending has been successful in narrowing down the gaps - gender gap and rural urban gap - which is typical of Indian society, thus, in the process helping the disadvantaged more than the advantaged."

VI.1 Education Spending Per Capita and Gender Gap in Primary Enrolment

By plotting real per capita education expenditure and male-female gap in primary enrolment over the period 1985-86 to 2000-01, one observes that eight out of 15 demonstrate a clear opposite

movement of the two variables (Annexure II). Of these eight states, the male-female gap over the years has come down to below 5 per cent for Maharashtra and has dissappeared for Punjab and Haryana, which is a positive trend. These are also the states with per capita real expenditure on education greater than Rs. 400/-.

For certain other states namely, Bihar, Orissa, U.P. Rajasthan, Gujarat and Goa, no conclusion can be drawn as such. Surprisingly for most of these states, education expenditure and gender gap have shown a co-movement since the mid 1990s, leading to a deterioration in the already existing disparties. Kerala has exhibited a trend of its own. The gender gap has remained at very low levels ever since mid 1980s. It fluctuated within a narrow range of 2-3 per cent from 1985-86 to 1997-98, subsequent to which it declined to around 1 per cent, associated with a jump in per capita real expenditure on education.

VI.2 Health Spending Per Capita and Rural-Urban Gap in Infant Mortality Rate

Plotting the rural-urban gap in IMR against the real per capita health expenditure over the period from 1985-86 to 1998-99 (Annexure III), one observes that unlike in case of education, real per capita health expenditure has not shown any rise for most of the states. In fact it has gone down for a few states e.g. Maharashtra and Uttar Pradesh. Secondly, rural-urban gap in IMR has also followed no consistent trend. For some states such as Haryana, Uttar Pradesh and Tamil Nadu, it has shown considerable decline over the years, while for other states like Andhra Pradesh and Punjab the gap has further widened in 1999 as compared to 1986. For Kerala, which ranks number 1 with respect to health attainment indicators, the per capita real health expenditure has remained more or less stagnant over the period under reference. The rural-urban gap in IMR has fluctuated between 2 and 8 per thousand and has remained more or less constant at 2 per thousand since 1997. Thus, we see that policy variable i.e. state spending seems to play a less important role in the case of health than education in explaining the gaps that prevail.

VI.3 Variation around All-India average

Table 12 : Co-efficient of variation

	Primary Enrolment	Secondary Enrolment	Education expenditure as % of GDP	Health Expenditure as % of GDP	Infant Mortality Rate
1985-86	18.75	8.2	1.056	.368	28.2
2000-01	20.98	8.6	.868	.295	21.5

A look at the variation of the states around the All-India average between two time periods 1985-86 and 2000-01 reveals that both the expenditure variables (education and health expenditure as a percentage of GSDP) show a fall in inter-state disparities. Inter-state variation around all-India average with respect to IMR has also shown a fall. However, what is of concern in this context is the fact that all education outcome indicators are showing an increase in inter-state variations between 1985-86 and 2000-01 (Table 12).

Section VII

Conclusion and Policy Implications

The study presents an up to date analysis of the levels, pattern and effectiveness of public expenditure (state government expenditure) with respect to education and health and hints at certain policy prescriptions, some of which are standard while others are in the nature of providing policy direction and making it more focussed. The study clearly brings out that health status and educational attainment are multi-dimensional concepts whose outcomes are determined by complex interaction among a variety of variables, with the importance of each variable being different for health and education status and also for different stages of education.

Panel data evidence reveals that public spending on primary education has a perceptible impact on enrolment ratios and therefore reinforces the need to protect or even step up public spending. However, the role of public spending decreases at higher stages of

education. It needs mention that female education is instrumental in enhancing both primary and secondary enrolments. Further, the relationship between public spending on education and primary enrolment is stronger for poorer states.

The association between public spending and health outcome turns out to be weaker. Income turns out to be a more significant determinant of health outcome than public spending. Child survival is probably related to other factors such as adequate nutrition and overall living conditions, which are income determined. This result, which has also been the finding of some earlier studies, presents a policy dilemma-whether government should invest in health or not? The section on international comparisons clearly reveals that public expenditure on health accounts for only 18 per cent of total expenditure on health in India, which is quite low as compared to international standards. Even this meagre expenditure is very often not targeted towards primary health care services. Much of this expenditure in India is devoted towards payment of salaries and maintaining the existing facilities. The trend analysis makes it quite clear that the proportion of GSDP being spent on health has not only remained low, but also declined over the last fifteen years. All these taken together could mean that the weak relationship between public spending and health outcomes is probably not an indication of ineffective health expenditure, but of inadequate level of public spending and poor targeting.

The main limitations of this kind of analysis are well documented. Cross state analysis does not allow for direct assessment of the impact of micro determinants of education and health outcomes such as school management indicators, quality of health services being rendered, etc. Some other macro variables such as private sector spending, governance issues (influencing the quality of expenditure) have been excluded from the analysis for lack of data. Notwithstanding the fact that these variables have not been incorporated directly, logical interpretations and fixed effect coefficients do point to the importance of these excluded variables in explaining the differences in performance of various states. From analytical angle, future research in the area can consider exploring the distributional effects of state spending. And from econometric

technique point of view, researchers can explore the relative role of different factors for different states by examining the slope coefficients.

Notes

1. Control of disease vectors and protection of food and water safety are defined as examples of (nearly) pure public goods in health while public intervention to control communicable diseases provides substantial externalities.

2. A World Bank Study: India, Reducing Poverty, Accelerating Development, Oxford University Press, 2000, pp.21-32.

3. Privatisation of public services in health and education during the reform phase in China has although attracted some criticism.

4. Education spending data refer to public spending-government spending on public education plus subsidies for private education. Many countries supplement public funds for education. Teachers' compensation accounts for two-thirds of education spending.

5. It is emphasised that the efficiency of use of resources as well as the initial levels of attainment and the policies pursued by state governments are also important in determining the social sector attainment levels.

6. Education sector is placed in the concurrent list while health is a state subject.

7. Latest information relating to plan outlays during the Ninth Plan places the actual plan expenditure at Rs. 24, 908.38 crore.

8. For Statewise analysis of health care expenditure, we have taken only the medical and public health expenditure of various states, thereby excluding the family welfare component as most of the expenditure on family welfare is met by central transfers.

9. One limitation of taking education expenditure as a proportion of GSDP is the fact that states with low GSDP such as Orissa and Bihar may show high ratios, though actual expenditure on education sector, both in absolute and per capita terms remains significantly lower.

10. See Bidani and Ravallion (1997) (Linear model), Baldacci, Guin Siu and Mello (2002) (Double log model) & Gupta, Verhoven and Tiongson (2001) (log-log and lin-log model).

11. There is evidence in the literature to support that linear specification is more appropriate for education regression and log-log specification for health regression though there is no unanimous answer in this regard.

12. It is to be noted that number of schools now refers to the number of higher secondary and high/post basic schools per lakh population of the particular state for the concerned year.

13. Co-operative action is described in terms of community participation and monitoring leading to accountability and better performance of educational institutions (Dreze and Sen, 2002). The effectiveness of community participation, however, depends on the extent to which the social structure is egalitarian and therefore works in the interest of the local community at large.

14. The Poverty Reduction and Growth Facility (PRGF) is the IMF's lending facility for low-income countries with an explicit focus on poverty reduction in the context of a growth

oriented strategy. PRGF eligibility is based on a country's per capita income and eligibility for assistance under the International Development Association (IDA).

15. Pritchett L. and Summers L (1993), 'Wealthier is Healthier', World Bank Policy Research Paper, 1150, Washington, D.C. World Bank, also cited in Appleton et al (1996).

16. The index is defined for a given country i as (ln(Max-Min)-ln(MRi-Min))/ln(Max-Min), where Max and Min refer to maximum and minimum of observed mortality rate respectively, MRi is the mortality rate observed in country i. As the mortality rate in country i approaches the minimum of observed mortality rates, the index for country i approaches 1.

17. Also in Wolfe (1986) cited in a World Bank study by Musgrave P. (1996) on ' Public and Private Roles in Health- Theory and Financing Patterns'.

18. Prabhu and Kamdar (2000) have tried to examine just the opposite relation-how income distribution impacts upon social attainment- at the all-India level using time series data over 1970-71 to 1994-95. They have used GINI Index as one of the independent variables and conclude that it is a significant determinant of education attainment, but not of health outcome.

19. The positive effect of per capita public health spending on the life expectancy of the poor is also admitted.

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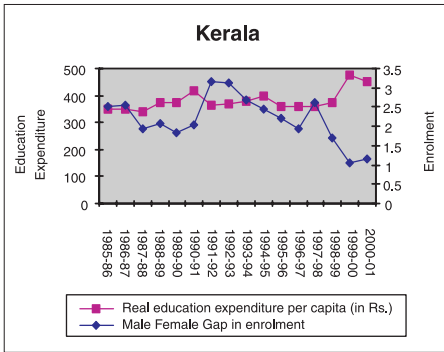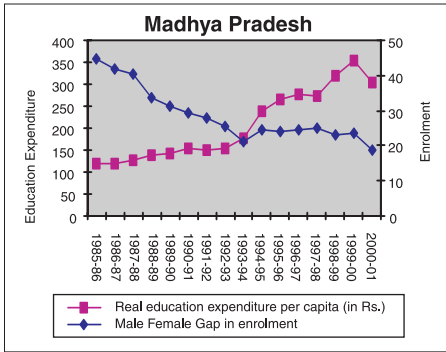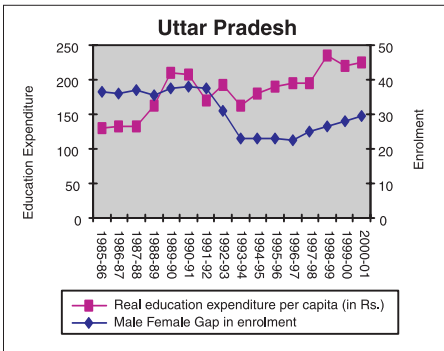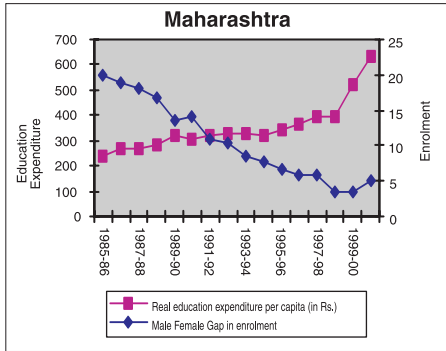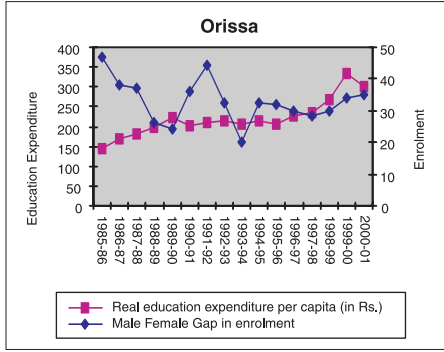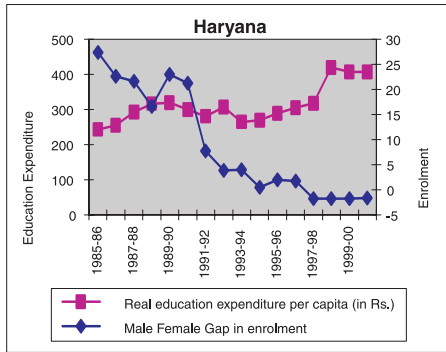
ANNEXURE I

Education & Health Attainment Indicators and Control Variables used in Empirical Studies

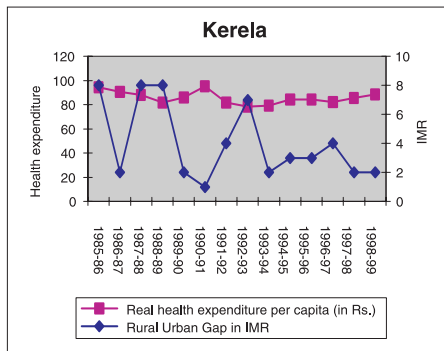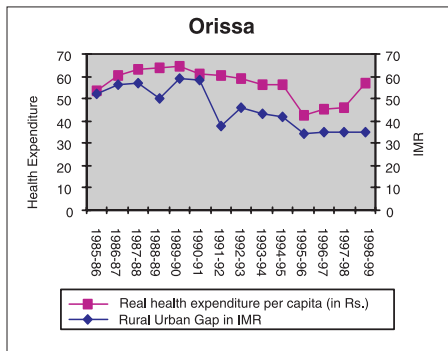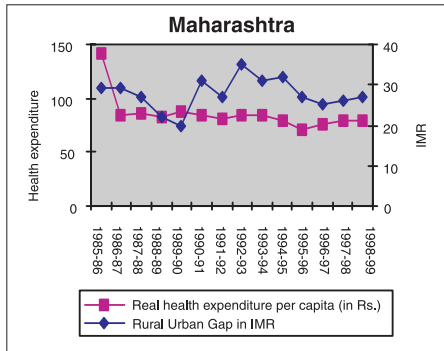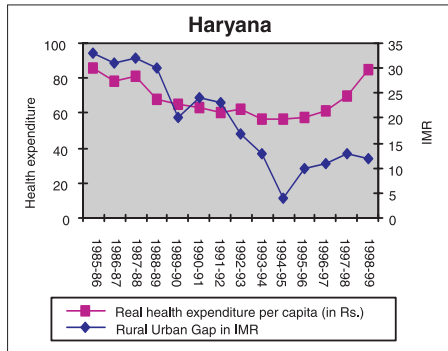| Attainment Indicators	Control Variables
Education	
• Gross enrolment in primary and secondary education • Persistence through Grade 4 (per cent of children reaching that grade) • Primary school drop out rates	• Per capita income • Public spending on education as a percentage of GDP • Public spending on education per student • Composition of public spending i.e., allocation to elementary, secondary and higher education • Parental perception of costs and benefits • Parental education • Urbanisation • Child nutrition • Demand factor being captured by income distribution or Gini coefficient • Teachers' salaries • Pupil-Teacher ratio
Health	
• Infant Mortality Rate (0 to 1 year) • Child Mortality Rate (0 to 5 years) • Life expectancy	• Per capita income • Public Health spending as a percentage of GDP • Composition of public health spending (primary, secondary and tertiary) • Poverty • Adult literacy rate • Female literacy rate • Access to sanitation and safe drinking water • Urbanisation • Demand factor being captured by income distribution or Gini Coefficient

Annexure II : Relationship between Education Expenditure and Enrolment

Select States with opposite movement

Haryana

Real education expenditure per capita (in Rs.)
Male Female Gap in enrolment

Maharashtra

Real education expenditure per capita (in Rs.)
Male Female Gap in enrolment

Madhya Pradesh

Real education expenditure per capita (in Rs.)
Male Female Gap in enrolment

Select States with no definite movement

Orissa

Real education expenditure per capita (in Rs.)
Male Female Gap in enrolment

Uttar Pradesh

Real education expenditure per capita (in Rs.)
Male Female Gap in enrolment

Kerala

Real education expenditure per capita (in Rs.)
Male Female Gap in enrolment

Annexure III : Relationship between Health Expenditure and IMR

Annexure IV : Data Sources

The data used has been collected from a variety of sources. All data pertaining to state-wise social sector expenditure, education and health in particular have been taken from State Finances- A Study of Budgets and earlier issues of RBI Bulletin. The National Accounts data of Central Statistical Organisation (CSO) has been utilised to calculate education and health expenditures as a percentage of GSDP for all states. Census data (population) has been used to calculate the per capita expenditures for different states. It may be noted here that we have used GSDP at market prices to calculate per capita expenditure. However, in the panel regression we have used, per capita NSDP at constant prices (1993-94 series) as one of the variables. The panel regression utilises various outcome indicators as already mentioned, collected from concerned Ministries. The time series data for Gross Enrolment Ratio (both primary and Secondary), No. of schools for different classes and the pupil-teacher ratio has been collected from Department of Education, Ministry of Human Resource Development (Sources are Education in India and Selected Educational Statistics, various issues). Statewise data on number of hospitals and beds have been collected from Health Ministry. The main source of information for Statewise time series data on Total Fertility rate (TFR) and Infant Mortality Rate (IMR) is the Office of Registrar General, Ministry of Home Affairs.

Annexure V

India: Income, Social outcome and Infrastructure Indicators in Selected Years

State	Indicators	1985-86	1990-91	1995-96	2000-01
All India	Per capita Income (Rs.)	6,120.7	7,430.3	8,625.1	10,428.0
	G. En. Ratio -Primary	95.62	100.10	88.6	95.7
	-Secondary	24.39	19.28	30.9	-
	IMR	97.0	80.0	74.0	66.0
	TFR	4.3	3.8	3.5	3.2*
	No. of Hospitals	7,474.0	11,254.0	15,097.0	15,501.0
	No. of Beds	5,35,735.0	6,19,433.0	6,23,819.0	6,81,643.0
	No. of Schools -Primary	6,63,718.0	7,12,391.0	7,67,555.0	8,45,007.0
	-Secondary	57,342.0	79,796.0	99,274.0	1,21,416.0
	Pupil-Teacher Ratio	36.0	38.0	38.0	39.0
Andhra Pradesh	Per capita Income (Rs.)	5,248.3	6,873.1	8,086.0	9,982.0
	G. En. Ratio -Primary	101.1	109.0	80.1	104.1
	-Secondary	22.3	4.1	31.0	-
	IMR	82.0	73.0	65.0	66.0
	TFR	3.8	3.0	2.5	2.4*
	No. of Hospitals	612.0	615.0	2,950.0	3,133.0
	No. of Beds	35,911.0	36,400.0	45,832.0	69,778.0
	No. of Schools -Primary	47,634.0	54,849.0	56,423.0	65,705.0
	-Secondary	4,724.0	5,882.0	7,983.0	10,359.0
	Pupil-Teacher Ratio	45.0	45.0	41.0	35.7
Bihar	Per capita Income (Rs.)	3,200.9	3,567.5	2,728.0	3,345.0
	G. En. Ratio -Primary	82.9	82.9	73.0	79.9
	-Secondary	16.9	11.7	15.4	-
	IMR	101.0	69.0	71.0	62.0
	TFR	5.2	4.4	4.5	4.5
	No. of Hospitals	226.0	298.0	328.0	328.0
	No. of Beds	22,574.0	28,137.0	29,090.0	29,090.0
	No. of Schools -Primary	62,821.0	66,116.0	66,969.0	66,922.0
	-Secondary	3,684.0	4,022.0	4,102.0	4,461.0
	Pupil-Teacher Ratio	43.0	44.0	51.0	57.9
Goa	Per capita Income (Rs.)	9,310.7	14,708.5	17,929.0	26,106.0
	G. En. Ratio -Primary	135.6	102.9	91.2	66.2
	-Secondary	41.4	55.0	58.1	-
	IMR	-	20.8	24.8	19.0
	TFR	-	-	-	-
	No. of Hospitals	95.0	108.0	114.0	118.0
	No. of Beds	3,004.0	3,383.0	3,644.0	3,953.0
	No. of Schools -Primary	1,166.0	1,125.0	1,135.0	1,137.0
	-Secondary	306.0	373.0	432.0	436.0
	Pupil-Teacher Ratio	29.0	25.0	24.0	22.5
Gujarat	Per capita Income (Rs.)	7,273.8	8,787.8	11,649.0	12,975.0
	G. En. Ratio -Primary	111.1	125.6	115.4	126.2
	-Secondary	24.7	32.1	34.8	-
	IMR	107.0	69.0	61.0	60.0
	TFR	3.8	3.1	3.0	3.0
	No. of Hospitals	1,236.0	1,563.0	2,528.0	2,528.0
	No. of Beds	38,915.0	46,374.0	63,417.0	63,417.0

State	Indicators	1985-86	1990-91	1995-96	2000-01
	No. of Schools -Primary	27,765.0	31,309.0	33,119.0	36,745.0
	-Secondary	4,297.0	5,122.0	5,713.0	6,343.0
	Pupil-Teacher Ratio	37.0	38.0	39.0	43.5
Haryana	Per capita Income (Rs.)	9,171.9	11,124.9	11,570.0	14,331.0
	G. En. Ratio -Primary	86.9	86.8	77.7	78.9
	-Secondary	19.0	29.0	26.6	-
	IMR	85.0	68.0	68.0	65.0
	TFR	4.4	4.0	3.5	3.2
	No. of Hospitals	87.0	78.0	79.0	80.0
	No. of Beds	7,527.0	7,003.0	7,180.0	7,250.0
	No. of Schools -Primary	6,199.0	6,513.0	7,000.0	12,905.0
	-Secondary	2,046.0	2,356.0	3,096.0	4,228.0
	Pupil-Teacher Ratio	36.0	37.0	36.0	32.6
Karnataka	Per capita Income (Rs.)	5,344.7	6,628.9	8,368.0	11,910.0
	G. En. Ratio -Primary	98.9	109.0	105.9	113.6
	-Secondary	28.3	29.8	34.3	-
	IMR	73.0	77.0	53.0	58.0
	TFR	3.5	3.1	2.6	2.5
	No. of Hospitals	238.0	288.0	293.0	293.0
	No. of Beds	31,342.0	34,477.0	38,449.0	38,479.0
	No. of Schools -Primary	38,855.0	40,207.0	44,139.0	49,848.0
	-Secondary	4,801.0	5,414.0	7,772.0	9,850.0
	Pupil-Teacher Ratio	39.0	44.0	42.0	39.4
Kerala	Per capita Income (Rs.)	5,688.3	6,850.9	8,748.0	10,627.0
	G. En. Ratio -Primary	109.7	102.8	94.0	87.1
	-Secondary	44.1	40.14	41.9	-
	IMR	27.0	16.0	14.0	11.0
	TFR	2.3	1.8	1.8	1.8
	No. of Hospitals	328.0	2,924.0	2,040.0	2,107.0
	No. of Beds	43,533.0	70,349.0	77,199.0	97,840.0
	No. of Schools -Primary	9,714.0	9,682.0	9,700.0	9,731.0
	-Secondary	2,435.0	2,627.0	3,196.0	4,182.0
	Pupil-Teacher Ratio	30.0	31.0	29.0	27.7
Madhya Pradesh	Per capita Income (Rs.)	5,283.3	6,359.5	6,778.0	7,003.0
	G. En. Ratio -Primary	97.4	106.1	95.3	111.4
	-Secondary	15.9	21.5	33.8	-
	IMR	118.0	117.0	97.0	86.0
	TFR	4.9	4.6	4.1	3.9
	No. of Hospitals	289.0	362.0	363.0	363.0
	No. of Beds	19,891.0	22,103.0	18,141.0	18,141.0
	No. of Schools -Primary	75,166.0	82,886.0	94,073.0	1,13,398.0
	-Secondary	-	4,500.0	6,378.0	10,199.0
	Pupil-Teacher Ratio	37.0	37.0	39.0	36.8
Maharashtra	Per capita Income (Rs.)	78,89.6	10,158.8	13,221.0	15,172.0
	G. En. Ratio -Primary	117.5	125.5	110.3	110.4
	-Secondary	30.8	32.8	41.0	-
	IMR	63.0	60.0	48.0	45.0

State	Indicators	1985-86	1990-91	1995-96	2000-01
	TFR	3.6	3.0	2.8	2.5
	No. of Hospitals	1,540.0	2,104.0	3,115.0	3,446.0
	No. of Beds	91,207.0	1,11,420.0	78,920.0	99,062.0
	No. of Schools -Primary	54,406.0	57,740.0	62,342.0	66,370.0
	-Secondary	8,177.0	9,972.0	13,093.0	14,767.0
	Pupil-Teacher Ratio	36.0	36.0	36.0	35.8.0
Orissa	Per capita Income (Rs.)	4,483.0	4,299.6	5,053.0	5,187.0
	G. En. Ratio -Primary	103.3	113.9	94.8	112.6
	-Secondary	21.7	20.2	24.4	-
	IMR	123.0	124.0	96.0	90.0
	TFR	4.2	3.3	3.1	2.7
	No. of Hospitals	311.0	287.0	430.0	273.0
	No. of Beds	12,223.0	13,988.0	14,884.0	11,980.0
	No. of Schools -Primary	45,429.0	49,438.0	53,114.0	53,614.0
	-Secondary	-	4,895.0	6,022.0	6,396.0
	Pupil-Teacher Ratio	33.0	33.0	29.0	34.7
Punjab	Per capita Income (Rs.)	10,257.0	11,775.5	13,008.0	15,390.0
	G. En. Ratio -Primary	97.9	96.4	81.5	79.1
	-Secondary	24.1	37.4	33.8	-
	IMR	68.0	53.0	51.0	51.0
	TFR	3.4	3.1	2.8	2.5
	No. of Hospitals	258.0	230.0	220.0	220.0
	No. of Beds	14,617.0	15,018.0	14,821.0	14,926.0
	No. of Schools -Primary	13,767.0	13,821.0	14,253.0	15,610.0
	-Secondary	2,298.0	2,759.0	3,142.0	3,388.0
	Pupil-Teacher Ratio	30.0	34.0	33.0	32.0
Rajasthan	Per capita Income (Rs.)	4,657.4	6,759.8	72,16.0	7,937.0
	G. En. Ratio -Primary	79.4	79.2	84.5	112.0
	-Secondary	16.3	23.2	36.3	-
	IMR	107.0	79.0	85.0	79.0
	TFR	5.0	4.6	4.2	4.2
	No. of Hospitals	244.0	267	218.0	219.0
	No. of Beds	19,544.0	21,815.0	21,187.0	21,447.0
	No. of Schools - Primary	35,581.0	39,674.0	46,959.0	51,284.0
	-Secondary	2,124.0	4,053.0	4,902.0	6,709.0
	Pupil-Teacher Ratio	33.0	32.0	33.0	39.7
Tamil Nadu	Per capita Income (Rs.)	6,320.6	7,863.8	10,177.0	12,779.0
	G. En. Ratio -Primary	130.8	134.0	128.4	96.4
	-Secondary	28.9	37.0	43.3	-
	IMR	80.0	57.0	53.0	49.0
	TFR	2.7	2.2	2.1	2.0
	No. of Hospitals	402.0	408.0	408.0	408.0
	No. of Beds	44,263.0	48,780.0	48,780.0	48,780.0
	No. of Schools - Primary	34,809.0	35,603.0	36,020.0	36,845.0
	-Secondary	4,123.0	5,147.0	5,909.0	7,939.0
	Pupil-Teacher Ratio	38.0	42.0	46.0	35.2

State	Indicators	1985-86	1990-91	1995-96	2000-01
Uttar Pradesh	Per capita Income (Rs.)	4,270.4	5,130.8	5,229.0	5,770.0
	G. En. Ratio -Primary	70.0	71.1	61.2	65.7
	-Secondary	23.0	23.8	25.5	-
	IMR	132.0	97.0	85.0	82.0
	TFR	5.4	5.1	4.9	4.7
	No. of Hospitals	735.0	735.0	735.0	735.0
	No. of Beds	47,278.0	47,278.0	47,278.0	47,278.0
	No. of Schools -Primary	90,483.0	95,611.0	1,08,333.0	1,20,005.0
	-Secondary	2,361.0	6,053.0	6,977.0	9,915.0
	Pupil-Teacher Ratio	33.0	40.0	39.0	39.4
West Bengal	Per capita Income (Rs.)	5,387.5	5,990.7	7,492.0	9,778.0
	G. En. Ratio -Primary	111.4	113.9	100.1	107.2
	-Secondary	27.2	27.3	25.2	-
	IMR	71.0	71.0	55.0	51.0
	TFR	3.6	3.2	2.6	2.4
	No. of Hospitals	409.0	410.0	399.0	400.0
	No. of Beds	52,907.0	53,977.0	55,230.0	53,658.0
	No. of Schools -Primary	53,424.0	53,541.0	53,825.0	54,768.0
	-Secondary	5,524.0	6,491.0	7,293.0	9,382.0
	Pupil-Teacher Ratio	36.0	44.0	46.0	48.8

Per capita income refers to Per capita Net State domestic product at constant prices (1993-94)
Note: For detailed data source see Annexure IV.