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Literate Life Expectancy in India

Introduction

THE expectation of life at birth (e_0^0) is the life table function, most frequently used as an index of the level of mortality. It is useful as a measure of longevity in a population as well as an index of mortality conditions. It also represents a summarisation of the whole series of mortality rates for all ages combined, as weighted by the life table stationary population (Shryock *et al.*, 1976; Ramakumar, 1986). Economically, increases in the life expectancy also increases the expectation of returns from investments like education, housing, consumer durable and other such items. Given all the problems involved in directly measuring health, longevity is still the best proxy of health and possibly even of emotional conditions (Lutz, 1994-95).

Education is a basic human right. It is also the key, which opens many economic, social and political doors for people. It increases access to income and employment opportunities (Haq and Haq, 1998). The societies, which have acquired the relevant knowledge and skills, can only compete successfully in global markets. It can be seen that those countries that have done significantly better in several aspects, ranging from population stabilisation to economic development and social equity, are those where basic education was a priority. But it is surprising that about 850 million adults in the world today cannot even read or write, around 400 million of which are in the South Asia region. South Asia has over the last three decades, emerged as the most illiterate region in the world (Haq and Haq, 1998). In India about 48 percent of the total population are illiterate.

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Several societies of the world have proved that economic development is not necessary to raise female literacy rates. The countries China, Sri Lanka and Zimbabwe have raised adult women's literacy to more than 70 percent (UN, 1995) and the Kerala state in India achieved universal literacy. These societies achieved this with limited resources and strong political commitment. Several richer countries lag behind in literacy. The decision to invest in education and health of people, irrespective of gender, seems to cut across income levels, political ideologies, cultures and stages of development (UN, 1994). Socialist Countries used social and political mobilisation to achieve rapid and equal progress in education and health for men and women and to encourage social transformations to expand opportunities for women (UN, 1995, 97).

Gender gaps in education and health have narrowed down in the past two decades in the world and female life expectancy has increased 20 percent faster than male life expectancy over the past two decades. But in India, the literacy rate increased one and half times from 34 percent in 1971 to 52 percent in 1991 (Table 1), but it is still very low, especially for females. Earlier, literacy was primarily an elitist and urban experience, and governmental concern for mass illiteracy is a 20th century phenomenon. Those who have worked closely with illiterate people remind us that the illiterate person is neither ignorant nor stupid (PRB, V. 30, No. 2). Now Mass literacy was generally accepted as an input aid for development. Development programmes required large-scale public understanding and participation.

TABLE 1: PERCENT LITERATE IN INDIA

Year	*Males*	*Females*	*Total*
1971*	45.9	22.2	34.4
1981*	53.5	28.5	39.3
1991**	64.1	39.3	52.2

*Based on the population age 5 years and above.
**Based on the population age 7 years and above.

The 1991 census gives that in India about 52 percent of the population are literate, in which the male literacy rate was 64 percent and that of females 39 percent. These rates relate to population aged 7 and above and the rate for both sexes together show an improvement of roughly 9 percent points over the 1981 rate of 43 percent for the same age group (Premi, 1991). Despite the rise in literacy among both males and females, there has been an increase in absolute number of illiterates in the country in each of the censuses. The number of illiterates increased from 334 million in 1961 to 492 million in 1991. There is some improvement in female literacy rate than that of males in relative terms, the absolute gap in literacy between males and females remained almost the same during the period 1971-'91 (NFHS, 1992-93).

The life expectancy shows that during the last two decades, the sex differentials in life expectancy have reversed (Table 2): females in India now live slightly longer than

males. The estimates of life expectancy show that female life expectancy increased by about 10 years during the period 1970-'91 while the increase in male life expectancy during this period was below 8 years. Using the statistics on life expectancy and literacy, many social scientists and organisations assess the health situation and quality of life of Indian population. Recently, the Population Foundation of India calculated Human Development Index (HDI) by using three components, expectation of life at birth, adult literacy and per capita state domestic product (SDP). The index for Kerala is 63 as of 1995, the highest among the major states and the lowest is reported for Bihar (34).

TABLE 2: LIFE EXPECTANCY, INDIA

Period	*Males*	*Females*
1970–75	50.5	49.0
1981–85	55.6	56.4
1986–90	58.1	59.1
1991–96	60.6	61.7

For calculating Human Development Index (HDI) and Physical Quality of Life Index (PQLI), the two most important factors considered are life expectancy and literacy. Wolfgang Lutz (1994-'95) proposed a new indicator of social development, namely Literate Life Expectancy (Le_x). This index combines the basic social development aspects of life expectancy and literacy together. It can be defined as the average number of years a man or woman lives in a literate state i.e., able to read and write under current mortality and literacy conditions.

Literate life expectancy (Le_x) as a summary measure of social development is based on two factors, age specific mortality rates and age specific proportion literate. The individual survival probabilities and empowerment through basic education are two of the most important aspects of human quality of life index. Higher literate life expectancy shows not only development but also social improvements and quality of life in a very comprehensive and sensitive manner. The objective of this study is to estimate Literate Life Expectancy (Le_x) for India by combining the two most important indicators of human development index, that is, life expectancy and literacy together. This will help to know how many years the men and women of India will live in literate state. Further to calculate HDI using this Le_x and compare the index with the earlier one.

Data and Methodology

The data required for this analysis were taken from NFHS (1992-'93) reports of India. The basic data requirements are age specific death rates ($_nm_x$) and age specific proportions literate (PL_x). The estimation of literate life expectancy follows the ordinary

life table method (Ramakumar, 1986; Namboodiri and Suchindran, 1987; Srinivasan, 1998) that is used to calculate life expectancy, adding only that the number of person years at each age is weighed with the age specific proportion literate (Lutz, 1994-'95). That is, if l_x is exponential,

$$
\begin{aligned}
{}_nq_x &= 1 - \exp(-n\ {}_nm_x) \\
{}_nL_x &= (n/2)\ (l_x + l_{x+n}) + (n/12)\ ({}_nd_x - {}_nd_{x-n}) \quad \text{and} \\
T_x &= \Sigma\ L_x \\
\text{Then we have} \quad e_x &= T_x/l_x
\end{aligned}
$$

If PL_x is the age specific population literate, then the literate person years lived, (LL_x) is

$$LL_x = L_x\ PL_x$$

That is in an ordinary life table, the ${}_nL_x$ column is multiplied by PL_x to generate the LL_x column. The literate life expectancy Le_x is then obtained by dividing the cumulative literate person years (LT_x) by the l_x column. That is,

$$
\begin{aligned}
LT_x &= \Sigma\ LL_x \\
\text{Then} \quad Le_x &= LT_x/l_x.
\end{aligned}
$$

Results and Discussions

As already mentioned, the necessary data for this analysis are age specific death rates and age specific proportion literate. The ordinary and literate life tables are presented in Tables 3 to 5. According to NFHS, the life expectancy at birth is 65.4 years for total population and it is about 30 years to those who have completed 50 years. The life expectancy at birth is 64 and 67 years for males and females respectively. The literate life expectancy is only 29.8 years (Fig. 1) for the total population and it is only 10 years to those who have completed 50 years. The Le_x at birth in India is 37.7 years and 21.1

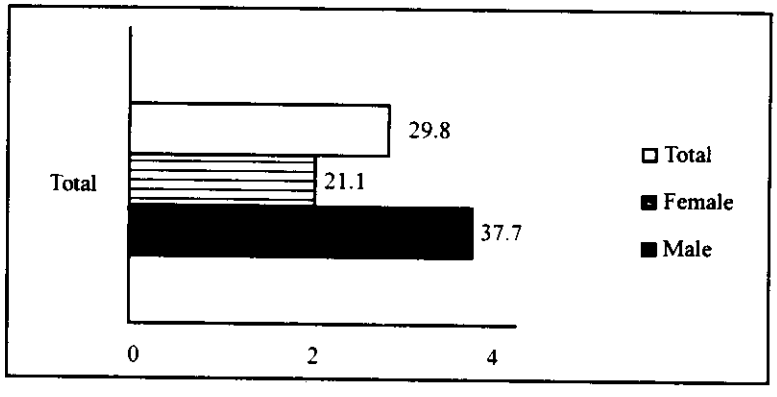

Fig. 1. Literate Life Expectancy at Birth—India

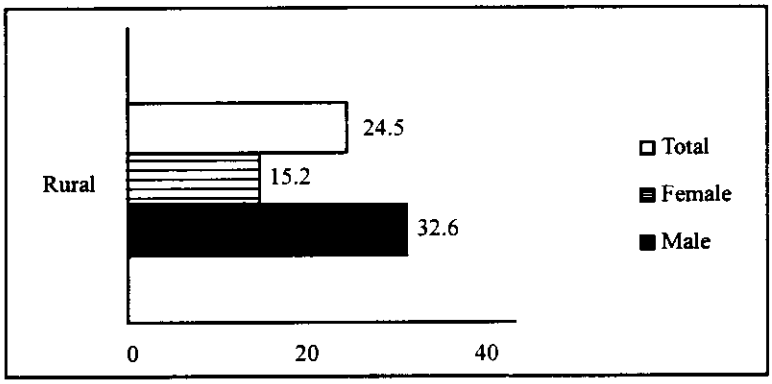

Fig. 2.

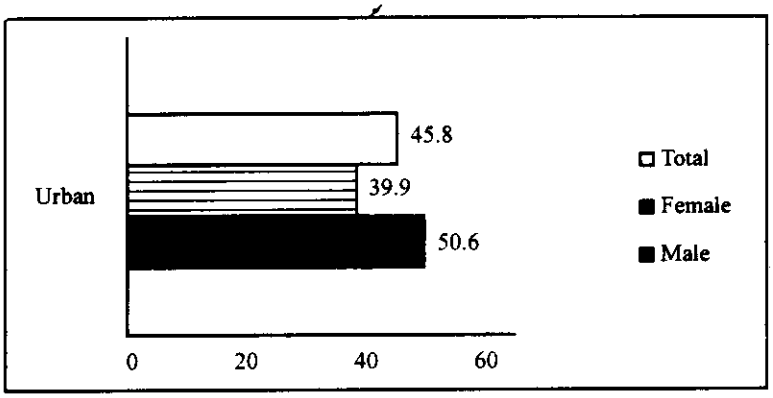

Fig. 3.

years for males and females respectively. Again a man who have completed 50 years will live about 14 years in a literate state, while a 50 year old Indian woman will live only 5 years in a literate state on an average. Usually the Le_x is lower than the actual life expectancy, it is because of the illiteracy in the early childhood period, disabilities and secondary illiteracy due to different causes and the small proportion of literate people in older age groups.

In rural India, an individual at birth lives on an average about 25 years in a literate state (Fig. 2). The gender gaps in Le_x are higher in rural areas; women in rural areas would live in literate state only a half of that of men. The women who have completed 50 years would live only three more years as literate. In urban areas, the Le_x at birth is 46 years for the total population, about 51 years for the males and about 40 years for females (Fig. 3). That is, even in the urban areas also there is a significant gender gap in Le_x. The female life expectancy is slightly better than males in recent years, but this benefit has reversed, when combines life expectancy with literacy. This clearly shows the position of Indian women in basic education. Basic education is important

TABLE 3

Age	*Ordinary Life Table*						*Literate Life Table*				
	${}_nm_x$	${}_nq_x$	l_x	${}_nd_x$	${}_nL_x$	${}_nT_x$	e_x	PL_x	LL_x	LT_x	Le_x
Total Male											
0-4	0.0230	0.1086	100000	10860	472850	6417895	64.2	0.000	0	3769686	37.7
5-9	0.0021	0.0104	89140	927	439244	5945045	66.7	0.640	281116	3769686	42.3
10-14	0.0016	0.0080	88213	706	439208	5505801	62.4	0.821	360590	3488570	39.5
15-19	0.0020	0.0100	87507	875	435418	5066593	57.9	0.805	350511	3127980	35.7
20-24	0.0025	0.0124	86632	1074	430558	4631175	53.5	0.775	333682	2777469	32.1
25-29	0.0024	0.0119	85558	1018	425222	4200617	49.1	0.712	302758	2443787	28.6
30-34	0.0026	0.0129	84540	1091	420003	3775395	44.7	0.683	286862	2141029	25.3
35-39	0.0040	0.0198	83449	1652	413349	3355392	40.2	0.666	275290	1854167	22.2
40-44	0.0051	0.0252	81797	2061	404003	2942043	36.0	0.654	264218	1578877	19.3
45-49	0.0075	0.0368	79736	3134	404280	2538040	31.8	0.634	256314	1314659	16.5
50+	0.0359	1.0000	76602	76602	2133760	2133760	27.9	0.496	1058345	1058345	13.8
Total Female											
0-4	0.0236	0.1113	100000	11130	472175	6720128	67.2	0.000	0	2109629	21.1
5-9	0.0025	0.0124	88870	1102	437417	6247953	70.3	0.536	234456	2109629	23.7
10-14	0.0017	0.0085	87768	746	436827	5810536	66.2	0.641	280006	1875173	21.4
15-19	0.0029	0.0144	87022	1253	432189	5373709	61.8	0.562	242890	1595167	18.3
20-24	0.0027	0.0134	85769	1149	425929	4941520	57.6	0.477	203168	1352277	15.8
25-29	0.0029	0.0144	84620	1219	420082	4515591	53.4	0.413	173494	1149109	13.6
30-34	0.0032	0.0159	83401	1326	413735	4095509	49.1	0.393	162598	975615	11.7
35-39	0.0030	0.0149	82075	1223	407275	3681774	44.9	0.377	153543	813017	9.9
40-44	0.0034	0.0169	80852	1366	400905	3274499	40.5	0.330	132299	659474	8.2
45-49	0.0047	0.0232	79486	1844	393019	2873594	36.2	0.281	110438	527175	6.6
50+	0.0313	1.0000	77642	77642	2480575	2480575	32.0	0.168	416737	416737	5.4
Total											
0-4	0.0233	0.1100	100000	11000	472500	6544151	65.4	0.000	0	2981801	29.8
5-9	0.0023	0.0114	89000	1015	438302	6071651	68.2	0.590	258598	2981801	33.5
10-14	0.0016	0.0080	87985	704	438035	5633349	64.0	0.734	321518	2723203	31.0
15-19	0.0025	0.0124	87281	1082	433858	5195314	59.5	0.681	295457	2401685	27.5
20-24	0.0026	0.0129	86199	1112	428228	4761456	55.2	0.618	264645	2106228	24.4
25-29	0.0027	0.0134	85087	1140	422597	4333228	50.9	0.563	237922	1841583	21.6
30-34	0.0029	0.0144	83947	1209	416741	3910631	46.5	0.539	224623	1603661	19.1
35-39	0.0035	0.0173	82738	1431	410205	3493890	42.2	0.532	218229	1379038	16.7
40-44	0.0043	0.0213	81307	1732	402330	3083685	37.9	0.502	201970	1160809	14.3
45-49	0.0062	0.0305	79575	2427	392097	2681355	33.7	0.472	185070	958839	12.0
50+	0.0337	1.0000	77148	77148	2289258	2289258	29.7	0.338	773769	773769	10.0

TABLE 4

Age	Ordinary Life Table						Literate Life Table				
	${}_nm_x$	${}_nq_x$	l_x	${}_nd_x$	${}_nL_x$	${}_nT_x$	e_x	PL_x	LL_x	LT_x	Le_x
Urban Male											
0-4	0.0144	0.0695	100000	6950	482625	6703824	67.0	0.000	0	5059926	50.6
5-9	0.0016	0.0080	93050	744	460804	6221199	66.9	0.775	357123	5059926	54.4
10-14	0.0016	0.0080	92306	738	459683	5760395	62.4	0.905	416013	4702803	50.9
15-19	0.0013	0.0065	91568	595	456293	5300712	57.9	0.897	409295	4286790	46.8
20-24	0.0018	0.0090	90973	819	452911	4844419	53.3	0.881	399015	3877495	42.6
25-29	0.0025	0.0124	90154	1118	448100	4391508	48.7	0.864	387158	3478480	38.6
30-34	0.0023	0.0114	89036	1015	442600	3943408	44.3	0.860	380636	3091322	34.7
35-39	0.0040	0.0198	88021	1743	436051	3500808	39.8	0.838	365411	2710686	30.8
40-44	0.0045	0.0222	86278	1915	426674	3064757	35.5	0.841	358833	2345275	27.2
45-49	0.0057	0.0281	84363	2371	416078	2638083	31.3	0.817	339936	1986442	23.5
50+	0.0369	1.0000	81992	81992	2222005	2222005	27.1	0.741	1646506	1646506	20.1
Urban Female											
0-4	0.0158	0.0760	100000	7600	481000	7558917	75.6	0.000	0	3988564	39.9
5-9	0.0019	0.0095	92400	878	457004	7077917	76.6	0.749	342296	3988564	43.2
10-14	0.0003	0.0015	91522	137	456959	6620913	72.3	0.843	385216	3646268	39.8
15-19	0.0017	0.0085	91385	777	455249	6163954	67.5	0.808	367841	3261052	35.7
20-24	0.0014	0.0070	90608	634	451395	5708705	63.0	0.737	332678	289321)	31.9
25-29	0.0024	0.0119	89974	1071	447630	5257310	58.4	0.688	307969	2560533	28.5
30-34	0.0028	0.0139	88903	1236	441494	4809680	54.1	0.661	291828	2252564	25.3
35-39	0.0021	0.0104	87667	912	435920	4368186	49.8	0.656	285964	1960736	22.4
40-44	0.0023	0.0114	86755	989	431335	3932266	45.3	0.592	255350	.1 674772	19.3
45-49	0.0049	0.0242	85766	2076	424093	3500931	40.8	0.561	237916	1419422	16.5
50+	0.0272	1.0000	83690	83690	3076838	3076838	36.8	0.384	1181506	1181506	14.1
Urban Total											
0-4	0.0151	0.0727	100000	7270	481825	7051078	70.5	0.000	0	4582236	45.8
5-9	0.0017	0.0085	92730	788	458979	6569253	70.8	0.762	349742	4582236	49.4
10-14	0.0010	0.0050	91942	460	458423	6110274	66.5	0.875	401120	4232494	46.0
15-19	0.0015	0.0075	91482	686	455789	5651851	61.8	0.852	388332	3831374	41.9
20-24	0.0016	0.0080	90796	726	452182	5196062	57.2	0.808	365363	3443042	37.9
25-29	0.0025	0.0124	90070	1117	447720	4743880	52.7	0.779	348774	3077679	34.2
30-34	0.0025	0.0124	88953	1103	442009	4296160	48.3	0.764	337695	2728905	30.7
35-39	0.0031	0.0154	87853	1353	435987	3854151	43.9	0.754	328734	2391210	27.2
40-44	0.0035	0.0173	86500	1496	428820	3418164	39.5	0.727	311752	2062476	23.8
45-49	0.0054	0.0266	85004	2261	419686	2989344	35.2	0.706	296298	1750724	20.6
50+	0.0322	1.0000	82743	82743	2569658	2569658	31.1	0.566	1454426	1454426	17.6

TABLE 5

Age	Ordinary Life Table						Literate Life Table				
	${}_nm_x$	${}_nq_x$	l_x	${}_nd_x$	${}_nL_x$	${}_nT_x$	e_x	PL_x	LL_x	LT_x	Le_x
Rural Male											
0-4	0.0254	0.1193	100000	11930	470175	6346716	63.5	0.000	0	3262290	32.6
5-9	0.0023	0.0114	88070	1004	433288	5876541	66.7	0.598	259106	3262290	37.0
10-14	0.0016	0.0080	87066	697	433461	5443254	62.5	0.791	342867	3003184	34.5
15-19	0.0022	0.0109	86369	941	429596	5009793	58.0	0.770	330789	2660317	30.8
20-24	0.0029	0.0144	85428	1230	424185	4580197	53.6	0.729	309231	2329528	27.3
25-29	0.0024	0.0119	84198	1002	418389	4156012	49.4	0.648	271116	2020297	24.0
30-34	0.0027	0.0134	83196	1115	413240	3737623	44.9	0.440	181825	1749181	21.0
35-39	0.0040	0.0198	82081	1625	406555	3324383	40.5	0.593	241.087	1567355	19.1
40-44	0.0053	0.0262	80456	2108	397211	2917828	36.3	0.570	226410	1326268	16.5
45-49	0.0082	0.0402	78348	3150	384300	2520617	32.2	0.555	213286	1099858	14.0
50+	0.0352	1.0000	75198	75198	2136317	2136317	28.4	0.415	886572	886572	11.8
Rural Female											
0-4	0.0259	0.1215	100000	12150	469625	6460336	64.6	0.000	0	1524922	15.2
5-9	0.0026	0.0129	87850	1133	431827	5990711	68.2	0.471	203390	1524922	17.4
10-14	0.0022	0.0109	86717	945	431142	5558885	64.1	0.571	246182	1321532	15.2
15-19	0.0034	0.0169	85772	1450	425444	5127743	59.8	0.472	200810	1075350	12.5
20-24	0.0032	0.0159	84322	1341	418213	4702299	55.8	0.378	158084	874540	10.4
25-29	0.0031	0.0154	82981	1278	411685	4284086	51.6	0.307	126387	716456	8.6
30-34	0.0034	0.0169	81703	1381	405108	3872400	47.4	0.283	114645	590069	7.2
35-39	0.0033	0.0164	80323	1317	398293	3467293	43.2	0.259	103158	475423	5.9
40-44	0.0039	0.0193	79005	1525	391301	3069000	38.8	0.220	86086	372265	4.7
45-49	0.0046	0.0227	77480	1759	383103	2677699	34.6	0.178	68192	286179	3.7
50+	0.0330	1.0000	75722	75722	2294596	2294596	30.3	0.095	217987	217987	2.9
Rural Total											
0-4	0.0257	0.1206	100000	12060	469850	6389197	63.9	0.000	0	2452770	24.5
5-9	0.0025	0.0124	87940	1090	432403	5919347	67.3	0.537	232201	2452770	27.9
10-14	0.0019	0.0095	86850	825	432074	5486943	63.2	0.685	295971	2220569	25.6
15-19	0.0028	0.0139	86024	1196	427287	5054869	58.8	0.618	264064	1924598	22.4
20-24	0.0030	0.0149	84829	1264	421012	4627581	54.6	0.541	227768	1660534	19.6
25-29	0.0028	0.0139	83565	1162	414877	4206569	50.3	0.476	197482	1432767	17.1
30-34	0.0030	0.0149	82403	1228	408974	3791692	46.0	0.443	181176	1235285	15.0
35-39	0.0037	0.0183	81175	1486	402271	3382718	41.7	0.438	181176	1235285	15.0
40-44	0.0047	0.0232	79690	1849	393979	2980447	37.4	0.403	158774	877915	11.0
45-49	0.0065	0.0320	77841	2491	383246	2586468	33.2	0.376	144100	719141	9.2
50+	0.0342	1.0000	75350	75350	2203222	2203222	29.2	0.261	575041	575041	7.6

for securing one's basic amenities, especially for women. It is the important factor for empowerment within society and the family.

The usefulness of an indicator depends on what needs it should be measured. The Le_x is a summary indicator of social development is based on two underlying sets of indicators, age specific mortality rates and age specific proportion literate. The life expectancy is considered as one of the good indicators of the health conditions of a society. Increase in the life expectancy is the one of the key factors for enjoying any kind of quality of life it also increase the expectation of returns from investments on education, housing etc.

Education is a critical for economic and social development. Education is the passport to accelerated economic growth, particularly in the context of a rapidly globalizing World economy (Haq and Haq, 1998). Literacy not only shows the current level of social development; it also characterises societies potential for future development. That is, life expectancy and basic education are the necessary prerequisite for any development in a society. Thus, Le_x (a joint measure of life expectancy and literacy) is a better indicator of social development of a society. The Le_x is a single number, which describes a population's quality of life and has a clear meaning . The planners and policy makers can make use of it easily than by considering two indicators separately.

The Human Development Index (HDI) is available for India from the UN reports. Data similar to those used in HDI by UNDP are available for 16 major states of India (PFI, 1998). As mentioned earlier they calculated the index using the three components: expectation of life at birth, adult literacy and per capita State Domestic Products (SDP). Here we calculated HDI using two components: literate life expectancy and per capita SDP. In this calculation the variables: expectation of life at birth and literacy were replaced by a single variable, literate life expectancy and took the index of SDP as the same as by the Population Foundation of India. Computational procedure are explained in Appendix I.

The HDI value for India is 45 by Population Foundation of India and 29 by our calculations (Table 6, Fig. 4). Hereafter say old and new index respectively. Within India, there is a wide variation between states, Kerala with HDI 63 and 45 as the highest and Bihar with values 34 and 18 as lowest by old and new procedures respectively. Gujarat, Haryana, Himachal Pradesh, Kerala, Maharashtra, Punjab and Tamil Nadu show as medium human development states. All the other states would fall under the low human development category. The States of Bihar, Madhya Pradesh, Orissa, Rajasthan and Uttar Pradesh, which together constitute about 45 percent of India's population, have HDI of less than 40 by old and below 25 by new procedures respectively.

The ranking of the states by both indices follows more or less same trend. The major difference is among four states, the fourth rank Tamil Nadu and sixth rank Haryana by old procedure were interchanged as sixth and fourth rank by new procedure. Similarly fifth rank Himachal Pradesh became seventh and seventh rank Gujarat became fifth. The

TABLE 6: HUMAN DEVELOPMENT INDEX (HDI)—INDIA AND MAJOR STATES

India and States	*Le_x*	*Index of Le_x*	*Index of SDP**	*HDI*	*HDI**
India	**29.8**	**37.3**	**20.4**	**28.8**	**45.0**
Andhra Pradesh	26.4	33.0	18.2	25.6	41.0
Assam	30.4	28.0	12.6	25.3	41.0
Bihar	22.7	28.4	7.8	18.1	34.0
Gujarat	34.4	43.0	23.7	33.4	49.0
Haryana	30.3	37.9	30.0	33.9	50.0
Himachal Pradesh	34.9	43.6	18.5	31.0	51.0
Karnataka	31.3	39.1	19.1	29.1	46.0
Kerala	57.5	71.9	17.5	44.7	63.0
Madhya Pradesh	22.6	28.3	13.4	20.8	37.0
Maharashtra	39.0	48.8	33.4	41.1	57.0
Orissa	26.8	33.5	12.4	22.9	38.0
Punjab	31.7	39.6	33.9	36.8	55.0
Rajasthan	22.4	28.0	14.3	21.2	38.0
Tamil Nadu	34.7	43.4	21.0	32.2	52.0
Uttar Pradesh	22.2	27.8	12.1	20.0	36.0
West Bengal	38.5	48.1	16.4	32.3	49.0

*Reproduced from the publication State of India's Population. Population Foundation of India. New Delhi.

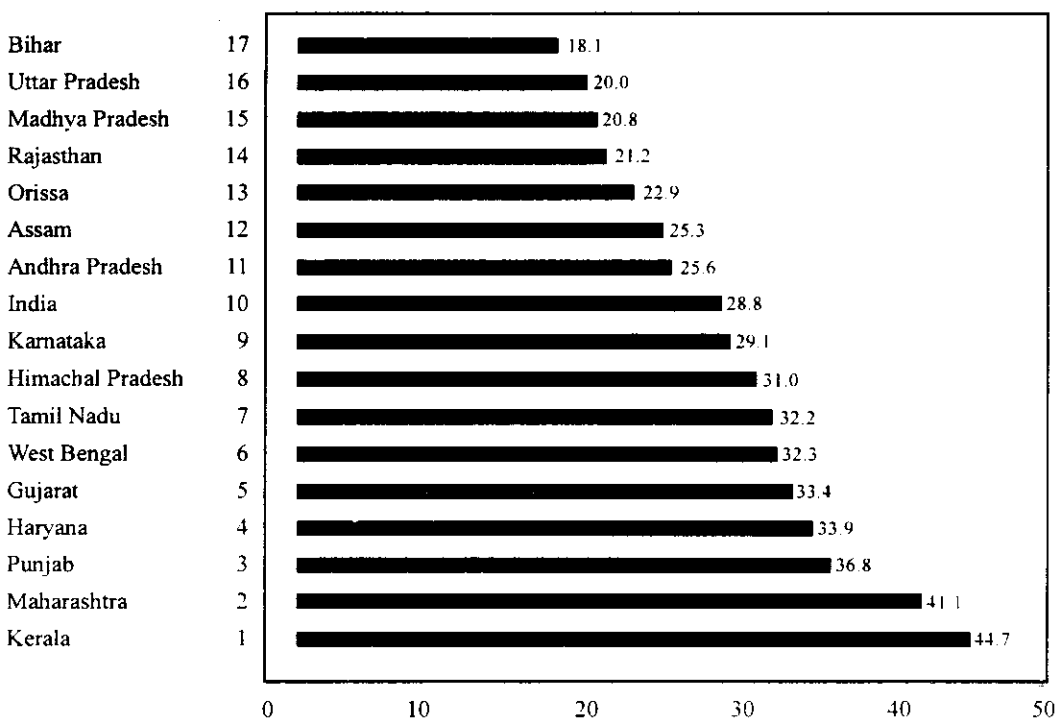

Fig. 4. Human Development Index—India and States

important reason for this change is the omission of middle school enrolment ratio in the calculation of new index. Though the value of new index is comparatively lower than the older one, both the indices show same trends in general. The low value of new index is because of low value of literate life expectancy. Hence it is better to use the new index, which combines both life expectancy and literacy together than considering them separately. We hope the new index is meaningful and convenient for policy makers and planners than the earlier one.

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Appendix I

Human Development Index (HDI)

This index is constructed as similar to the one constructed by Population Foundation of India (1998) for India and its major states. For construction of HDI we have used literate life expectancy (Le_x) and per capita state domestic product (SDP). Literate life expectancy is a combination of Life expectancy and literacy. For the calculation of Le_x the basic data requirements are Age Specific Death Rate ($_nm_x$) and proportion literate. We used data available for 1992-93. With regard to per capita state domestic product, we follow the procedure of Population Foundation of India. Each component index for literate life expectancy (I_1) and per capita state domestic product (I_2) were combined into a single index HDI by giving equal weights to them.

Index of Le_x (I_1) = $(Le_0 - 0)/(80 - 0)^* 100$

Where Le_0 is the literate life expectancy 0 and 80 are the minimum and maximum values of literate life expectancy.

Index of Income (I_2) = (SDP/GDP* 1400 – 100) (6482 – 100)* 100

Where SDP is the per capita state domestic product and GDP is the net domestic production of India.

Human Development Index (HDI) = $(I_1 + I_2)/2$