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Health Transition in India

Part I - Differentials and Determinants of Morbidity in India : Disaggregated Analysis

Part II - Health Scenario and Public Policy in India

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Preface

NCAER from time to time publishes working papers reporting the most recent research focus of the faculty members, based on the ongoing projects as well as their independent research. This working paper titled 'Health Transition in India' consists of papers recently written by Abusaleh Shariff, the Principal Economist and Head of the Human Development Research Area at the NCAER.

The first essay entitled 'Differentials and Determinants of Morbidity in India : Disaggregated Analysis' is an empirical analysis of survey data collected from 18,693 households across India. This survey was carried out during the summer months of May-June 1993. It is well recognised that NCAER is unique in collecting data through nationally representative sample surveys on morbidity and health expenditures. The survey cited above was the second in the series. The first survey was undertaken during May-July 1990. Another set of data will become available soon through a survey of 37,000 households conducted during January-May 1994. I an sure that, this essay and the subsequent analysis of the available data at the NCAER will help generate interest and develop policy alternatives underscoring the importance of morbidity studies in the context of human resource development in India.

The second paper is a critical essay on the health scene in India and the role of public health policy. In the light of the need to improve the health care of the millions living in poverty, and in rural and remote areas, this paper pleads for a re-definition of the concepts of 'health care' and 'accessibility'. Supply of appropriate health care seems to remain a distant dream in India and, therefore, urgent corrective actions are in order.

New Delhi
September 4, 1995

S.L. Rao
Director-General

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Part I
Differentials and Determinants of Morbidity in India : Disaggregated Analysis

Part I presents an empirical analysis of the most recent data on morbidity in India

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Differentials and Determinants of Morbidity in India: Disaggregated Analysis[1]

I. Introduction

Health for all by the year 2000 AD is a national goal set by the Indian policy makers over twenty years ago in Alma Ata. Since then a lot of planning, effort and public expenditure has been devoted to improve the human health both in the rural and urban parts of India. The spread and accessibility of modern medicine has also improved substantially across the country. However, in spite of concerted efforts India is one of the many developing countries which faces a high level of morbidity especially among the infants, children, women and the elderly. There is also a relatively high incidence of infectious or communicable diseases which are normally associated with low levels of sanitation, public hygiene and poor quality of drinking water. The treatment of sickness and containment of diseases are truly in the realm of medical and epidemiological expertise. Yet there certainly is a role to play by the social scientists and economists in studying morbidity and health patterns, explaining the health seeking behaviours, and assigning priorities for investments which will protect and maintain human health.

In the immediate past, 'morbidity' a state of ill health, has been increasingly recognised as a measurable indicator of wellbeing. This has a potential in replacing death and infant mortality rates as the indices of social development and personal wellbeing. Since the morbidity occurrence is relatively more frequent than the other two rates, it can also be accurately measured in a cost-efficient manner.

The available data on morbidity is being used to construct a 'disability-adjusted life year' (DALY) index for the international comparisons. DALY is 'a measure which combines healthy life years lost because of premature mortality with those lost as a result of disability' (The World Bank, 1993:1). The available data makes it possible to estimate the disease-specific DALYs at the level of a country. However, one major drawback of DALY estimates is that the estimates are based on the hospital based records of the type nature, the incidence and levels of disease and disability. But in the emerging economies such as India, the institutional and hospital based

statistics do not reflect the true or community levels incidence of disease and disability. Only a small fraction of the sick persons may approach hospitals for treatment, that too when they face severe and life threatening situations.

It is clear that to make an objective evaluation of the disease burden of a country and its many regions, *community level estimates of morbidity are essential.* The scope to collect and study the morbidity pattern in India is all the more imperative because, India is often described as a sub-continent with substantial regional, rural-urban and social group differentials in the standard and quality of life, including human health.

National Council of Applied Economic Research has been conducting national surveys since 1986 to establish the market structures for a variety of consumer goods. Along with the fourth study in the series of market information survey of households, a household survey of medical care utilization was also conducted in May-July 1990 in an effort to fill the above mentioned data gaps. The sampling procedures and sample distribution were common to both those surveys. The results of the first national survey of medical care evoked considerable interest among researchers and policy makers. However, the 1990 survey collected data relating only to illnesses which were formally treated. Drawing upon the experiences gained from the first survey, NCAER launched a second round of the survey in 1992-93 (henceforth referred to as NCAER 1993 survey) along with the fifth market information survey of households. The 1993 survey was carried out along with the fifth market information survey largely to save on the many types of overheads of survey operations. Thus the actual cost of this survey was only about one-third of the estimated cost if it were to be conducted as an independent survey. The 1993 survey accumulated data on morbidity, health care utilization and health expenditures in greater detail and covered both treated and untreated illness episodes. Data were also collected separately for the hospitalized and the non-hospitalized illness episodes. Information on the prevalence of illness, utilization and source of health care services, type of service providers, system of medicine, and the distance travelled to seek treatment were also collected in this survey. A detailed break-down of expenditure associated with each illness episode is also available. Data on illness episodes requiring hospitalization were collected separately. The survey also gathered data on a few socio-economic characteristics of the households.

II. Methods and Material

(a) Sample Size

A total of 6354 rural and 12339 urban households across all the states of India were covered in the NCAER Survey, 1993 (Statement 1)[2]. The largest sample was drawn for Uttar Pradesh with 1012 households in rural and 1802 households in urban areas. Sample size for a few other states such as Madhya Pradesh was 720 rural and 1010 urban households, Bihar was 672 rural and 717 urban households, and Maharashtra was 466 rural and 1287 urban households. A three-stage stratified sample design with varying probabilities in the first stage was adopted. Districts/towns, villages/urban blocks and finally the households were the sampling units in subsequent stages. The sample is representative of the respective rural and urban populations in each state. However, the sample size is not adequate for a disaggregated analysis at the level of the state. A note on the sampling design for a disaggregated morbidity analysis at the level of the country and states can be found in Appendix 1. Statement 1 presents the sample size distribution of the households, persons and numbers of persons reporting sickness during a 30-day reference period for major state by rural and urban residence.

(b) Definitions, Reference Period and Date of Survey

The 1993 survey was carried out during the summer months of May-June 1993. A pre-coded survey instrument was canvassed to any adult member to collect data relating to those sickness episodes (both treated and untreated) that occurred in a household during one month preceding the date of interview. All types of morbidity as reported by the respondents was collected which can be categorized as follows :

(i) Spells starting before the first day of the reference period and terminating within the reference period.

(ii) Episodes starting and terminating within the reference period.

(iii) Episodes starting within the reference period and continuing at the time of the interview.

(iv) Episodes starting before the reference period and continuing on the date of survey.

Since both the short duration and long duration (chronic) diseases are collected together, the prevalence rate for all kinds of sickness and injury

Statement 1: Statement Showing Number of Villages, Households, Individuals and Prevalence of Sickness by Residence and Major States

States	Rural					Urban				
	Villages	*Households*	*Persons*	*No. Sick*	*MPR/'000*	*Blocks*	*Households*	*Persons*	*No. Sick*	*MPR/'000*
Andhra Pradesh	46	351	1710	198	127	133	1090	4788	608	137
Assam	46	369	2075	170	83	22	182	1002	69	64
Bihar	84	672	4206	346	99	87	717	4162	381	102
Gujarat	38	304	1481	96	78	101	841	3963	299	84
Haryana	32	263	1594	98	77	41	320	1683	129	87
Himachal Pradesh	24	120	691	101	149	11	83	426	67	178
Karnataka	40	325	1825	188	109	104	867	4636	411	93
Kerala	28	241	1265	213	181	59	490	2553	416	175
Madhya Pradesh	90	720	5418	627	112	121	1010	6343	736	117
Maha-rashtra	60	466	2640	163	70	153	1287	6556	491	150
Orissa	26	205	1186	180	175	35	252	1627	285	163
Punjab	24	116	541	75	134	53	233	1041	152	145
Rajasthan	54	431	2623	290	119	43	584	3384	491	150
Tamil Nadu	42	323	1675	141	77	145	147	6117	427	75
Uttar Pradesh	126	1012	6443	603	101	213	1802	10473	823	79
West Bengal	32	257	1419	115	80	104	870	4059	302	81
TOTAL	**718**	**6354**	**37793**	**3666**	**103**	**1509**	**12339**	**65452**	**6336**	**100**

occurred during a reference period of 30 days prior to the date of survey can be computed from this data[3]. It will, however, be misleading to compute the annual Morbidity Prevalence Rates (MPRs) using this data. Episodes listed in item numbers *(i)* & *(ii)* together needs to be identified separately to compute the incidence rates. But such identification is not possible in the NCAER 1993 Survey of Morbidity.

(c) Type and Nature of Illnesses Categorization

The reported sickness do not entirely constitute clinically confirmed diseases. However, most of the sicknesses for which treatment was sought the patients and other household members would have known the name of the disease from the doctors and paramedical personnel. Thus the reporting of the diseases in fact presents a combination of self perceived lay reporting of symptoms and reporting of the clinically identified sickness. The reporting of the clinically identified sickness is also subjected to the recall and reporting errors. No effort was made in this survey to establish the authenticity of the clinically identified sicknesses. The symptoms and names of diseases thus collected were labelled using the lay reporting of illness technique developed by the World Health Organization (WHO, 1973). All such identified diseases were further grouped under three types of illness categories namely: infectious diseases, non-infectious diseases and others (mostly unspecific fevers).

(i) Infectious Diseases includes: typhoid, cholera, acute gastroenteritis, malaria, jaundice, mumps, measles, chicken pox, tuberculosis pneumonia, bronchitis, certain types of respiratory infections, cold and coughs, leprosy, urinary and general infections, sexually transmitted diseases.

(ii) Non-infectious Diseases includes: (*other than unspecified fevers*): constipation, indigestion, gastric acidity, gynaecological disorders, body aches and pains, head aches, weakness, dizziness, anaemia, arthritis, rheumatism, accidents and injuries, skin infections, cardio-vascular diseases, such as, BP, heart ailments, paralysis, diabetes, kidney related problems.

(iii) Fevers and Others: All types of unspecified fevers are included in this category largely because it was not possible to identify the fevers as infectious or non-infectious. Only less than 10 per cent in this category are those diseases which are not classifiable.

A second type of classification has also been made based on the nature of sicknesses, namely *(i) gastrointestinal disorders, (ii) respiratory tract infections, (iii) specified fevers, (iv) cardio-vascular, central nervous system and renal disorders, and (v) others.*

Tables 7 and 8 presents the 'type' and 'nature' of illnesses distributions respectively according to selected social and economic characteristics; and Tables 10 and 11 respectively according to selected states.

(d) Factors Influencing the Reporting of Morbidity

Before undertaking inter-group and inter-state comparisons of the MPRs it is useful to note as to how morbidity reporting can vary among the survey population. Besides the actual occurrence, on the whole, morbidity reporting depends upon perceptions regarding ill health, sickness and disease. In the following are listed a few possible reasons, one or more of these would explain inter-group and inter-state morbidity differentials :

- Many types of simple, common and frequently experienced sickness may not be reported.
- Morbidity reporting may improve as the level of household education increases more so if the female literacy improves.
- Many types of sickness in India are culturally sensitive due to unique associations between life and death, origins of sicknesses and so on. People may choose not to report sickness such as, tuberculosis, leprosy, leucoderma, STDs, psychiatric and gynaecological disorders and so on.
- In a survey situation, the respondent may not be fully aware of the spells of sickness suffered by other family members. This may be especially so in large households and joint family situations.
- Sickness suffered by infants and children may be under-reported if the respondent is not the biological mother or some one who normally care these children.
- Many types of sickness suffered by teenaged unmarried girls may not be reported.
- Proximity and exposure to medical care institutions may increase the reporting of morbidity.
- Treated and hospitalized episodes may be better reported.
- Reporting of sickness suffered by those who are now dead may be low.

(e) Appropriate Income Measure for Morbidity Analysis: Household versus Per Capita Income

At the outset, in this data, it is found that the direction of association between household income and morbidity is negative and between per capita income and morbidity is positive (Table 3). The per capita income as a measure of the level of income appears to under-evaluate the relationship between poverty and incidence of disease. In the following this issue has been further examined.

Since the per capita income is computed by dividing the household income by the household size, a number of the households and individuals get redistributed into the other income categories. The net direction in which this redistribution takes place will indicate how the direction of association changes when per capita income is used as an explanatory variable as opposed to the household income. Statement 2 attempts to summarise the relationships between the household and per capita income.

Statement 2

Deciles	*Percentage which fall within the Diagonal cell of the Matrix*	*Percentage falling below the Diagonal of the Matrix*	*Percentage falling above the Diagonal of the Matrix*	*Net difference between the percentages below and above the Matrix (4 — 3)*		
1	2	3	4	5		
					N	
1	76	0	29	+ 28	2935	
2	34	19	47	+ 29	2801	
3	23	29	48	+ 19	2116	12.7 %
4	22	35	43	+ 8	796	of the
5	19	30	51	+ 21	2145	total
6	23	33	44	+ 11	1237	sample
7	21	39	40	+ 1	95	
8	23	34	43	+ 9	941	
9	29	43	28	- 15	1813	6.1 %
10	47	53	0	- 53	4480	of the sample

A ten by ten matrix of the household and per capita income decile groups was created. In this matrix the number of cases which are common to both the household and per capita income deciles were identified from the cells found on the diagonal of the matrix. Column 2 presents these percentages and they represent no change in the level of income measured either by household or per capita income. In the third column the percentage of individuals falling below the diagonal of the matrix are presented. These individuals are those who are relatively worse-off according to the household income but categorised as relatively well-off according to the per capita income. The fourth column presents the percentage of people falling above the diagonal of the matrix. These individuals are those who are relatively well-off according to the household income but relatively worse-off according to the per capita income.

On the whole the matrix distribution suggests that 6.1 per cent of all individuals in this sample data are categorised as relatively poorer when the per capita income distribution is considered. On the other hand 12.7 per cent of the individuals have been categorised as relatively richer than their household income status when the per capita income criteria is used. The net effect, therefore, is that the *per capita income criteria seems to overstate the relative levels of living* and creates an illusionary higher levels of income. Such a type of overstatement is much larger in the urban sample in which 18.6 per cent have been categorised as relatively richer as opposed to only 5.2 per cent as relatively poorer when the per capita income is considered.

Second issue which is relevant is to see if the larger households have relatively young age distribution, if so how will it affect the household size and income relationships. Almost 45 per cent of the large households (having 8 members and over) do belong to the lowest household income category. But the net contribution of this group of households is small because less than 10 per cent of the total sample population reside in such households. Besides, it is found that morbidity levels are low in all household size categories at low levels of per capita incomes, relative to the household income categories.

Third aspect which is relevant in this debate is the impact of differences in the misreporting of income at the lower and higher levels of income. For example the same proportion of household income misreporting will cause lower effects at the lower levels of income than the higher levels of income. Such misreporting biases are carried over and also camouflaged when the per capita incomes are calculated making any further corrections of the data impossible.

Fourthly, the per capita income is a crude and unstandardised ratio of household income and household size which ignores the impact of age structure, and the age and sex biases present in the intra-household distribution of income, resources and consequent welfare. Since this precisely is the objective of morbidity analysis it is appropriate to use the household income rather than the per capita income as an indicator of levels of living. It may also be noted that the relationship between income and incidence of morbidity is not a direct one. The risk of morbidity is normally determined by the household level factors such as the level of hygiene and sanitation, access to clean and potable water, nutrition supply and access to health care and so on. These above *proximate determinants of morbidity are influenced by the level of household income* and not by the per capita income. Keeping all the above factors in mind, in the subsequent discussion of income and morbidity relationships only the household income will be considered, although distributions according to per capita income is also presented as an additional information (Tables 3, 5, 7 and 8.)

III. Population and Household Characteristics

Table 1 presents the age and sex distribution of the sample population. Population less than fifteen years of age is about 32 per cent and older population above sixty years of age is only five per cent. These percentages are marginally lower than the expected age distribution. Age misreporting and the under count (under-reporting) of the younger population are the possible reasons for this scenario. However, since all the calculations and distributions in this paper are computed after applying the population weights, some of the distortions emerging from the age under-reporting have been minimized. An evaluation of the age data according to selected socio-economic characteristics and according to states suggests a uniform pattern. Thus a marginally lower representation of the young and the old in this data may not affect the morbidity prevalence rate in a inter-group relative and comparative context.

Table 2 presents the percentage distribution according to household income, place of residence, education of the head of the household and household size. The urban population in this sample are relatively richer, for example, while about 63 per cent of the rural population belonged to less than Rs.18,000 income category and only 37 belong to this category in urban areas. The proportion of population in the higher income categories were substantially higher for the urban areas. Secondly, there is a steep and positive association between the household income and the education level of the head of the households. Thirdly, smaller households are relatively worse off than the larger ones in terms of the household income. For example, about 64 per cent of the smaller households belonged to less than Rs. 18000 income category, but this percentage was as low as 45 per cent in the large households. The percentages in the above Rs. 56000 category on the other hand were almost reverse at about 5 and 13 per cent respectively. Note that the income and household size relationship changes if per capita income is considered instead of household income. However, as has been argued above, in the studies of relationships between morbidity and levels of incomes, household income is a better indicator than the per capita income especially when data on other appropriate measures of the levels of living is not available.

IV. All-India Level MPR Differentials

(a) Differentials in the All-India MPRs by Sex, Place of Residence and Socio-economic Characteristics

Table 3 presents the MPRs by selected socio-economic variables. The weighted MPRs have worked out to be 104 and 101 per thousand population respectively for the rural and urban areas of the country. However, the sex differential in morbidity was considerable in urban areas (96 for males and 106 for females) than in the rural areas (102 and 105 respectively). A substantial variation in morbidity by age, nevertheless, was found both in urban and rural areas. On the whole there is a 'J' shaped relationship between age and morbidity. Similarly, the MPRs have been lower in urban areas in all ages excepting those less than five, and sixty years and above categories. It is speculated that, in the urban areas this is so because of better reporting of morbidity among young ages and higher prevalence of chronic sickness in the older ages.

The relationship between occupation and morbidity (data not presented) are also in the expected direction with the wage labourers reporting the highest morbidity among the workers category. In this data the non-worker category consists mostly of the non-school going children often less than five years of age. MPR has been found to be relatively low for Muslims both in rural and urban areas, and for SCs/STs in rural areas. These rates, nonetheless, needs to be interpreted cautiously.

Generally speaking, in both the rural and urban India, and both for females and males the MPRs decline as the levels of household head's education and the annual household income levels increase. This indicates that the relatively poorer and less educated sections of the population do face a higher risk of infection and disease. However, the association between per capita income and morbidity is positive negating the above mentioned relationship between poverty and risk of infections (more on this above). In this data the MPRs fall substantially as the household size increases in both rural and urban areas. This association is contrary to the expectation. In the subsequent multivariate analyses it has been demonstrated that this negative relationship between morbidity and household size may be due to reporting errors which needs to be taken a note of in any kind of morbidity analysis based on survey data. Tables 4 and 5 presents the MPRs according to household income and per capita income respectively and household size.

The MPRs according to age, sex, household income and household size (Table 6) mostly substantiates the above relationships with regard to female-male and rural-urban differentials. It is noteworthy to note, that in young ages male children have recorded relatively higher levels of morbidity both in rural and urban areas, but levels of morbidity reversed in the age groups 15-34 and 35-39 years. This appears to indicate a substantial presence of reproductive morbidity among females in both the rural and urban areas. Such sex differentials persists in other categorization based on income and household size.

(b) Type and Nature of Illness Distribution According to Socio-economic Categories

It has been mentioned above that the reported morbidity and illness were reclassified into two separate categories, one identified as the type of illness and the other identified as nature of illness. The three types of illness identified are infectious diseases, non-infectious diseases and, unspecified fevers and others. The nature of illness classifications are gastrointestinal disorders; respiratory infections; fevers; cardiovascular disorders, disorders of the central nervous system and genito-urinary disorders; and others. Tables 7 and 8 presents these data according to selected socio-economic categories respectively.

Thirtyfour per cent of all reported sickness has been categorized as infectious and 28 per cent as non-infectious. About 39 per cent of the reported sickness were one or another kind of fevers. It can be seen from Table 7 that children less than 5 years old and 5-14 years old have been reported to have been facing very high incidence of infectious diseases and they also face relatively more occurrences of fevers. The incidence of non-infectious diseases is only 5 per cent and 11 per cent respectively among the two younger age groups. However, individuals in the oldest age group face a very high (about 50 per cent) incidence of non-infectious diseases which are also likely to be chronic.

The incidence of infectious diseases falls, although at lower rates, as the level of household head's education and household income increases. The variation in the type of illness is not contrasting according to religion and caste, and household size. The incidence of infectious sickness in southern states has found to be lowest at about 29 per cent but highest in west at 43 per cent followed by 40 per cent in the Eastern states of West Bengal and

Assam. The central states of UP, Bihar, MP, Orissa and Rajasthan have recorded high incidence of fevers.

Table 8 presents the distribution of sick persons according to the nature of illness categories. It is well known that 'gastrointestinal' and 'respiratory' infections are very common complaints in India. On the whole 17 and 16 per cent of sickness respectively have been classified as gastrointestinal and respiratory. The incidence of both these types are found to be relatively high among the younger population of less than five years of age. Fevers are also very high in the younger age groups. Chronic sicknesses originating from the cardiovascular, motor and urinary aspects have been reported to be high among the older population, those who belong to higher education categories and who belong to richer households. These problems are also high in south followed by the eastern states.

V. Inter-State Differentials in Morbidity, Health Care Utilisation and Health Expenditures

(a) Morbidity Differentials

State level MPRs for both males and females are presented according to the place of residence (Table 9). It can be seen that relatively high morbidity has been recorded in the states of Kerala, Orissa, Himachal Pradesh, Punjab and Andhra Pradesh in rural areas, and Himachal Pradesh, Kerala, Orissa, Rajasthan, Punjab and Andhra Pradesh in urban areas. Some of the low morbidity states are Maharashtra, Tamil Nadu, Gujarat, West Bengal, Bihar and Uttar Pradesh in both rural and urban areas. While the MPRs are relatively high in both rural and urban areas in the high MPR states, they were relatively low in both rural and urban areas in the low MPR states, the urban rates were higher in ten states while they were lower in six states. Both the levels and differentials of MPRs between states and the rural/urban areas do not provide opportunities to clearly link the prevalence either to the levels of economic development and or to health infrastructures. Generally speaking it is expected that the so called backward states of UP, Bihar, Rajasthan and MP would record higher levels of morbidity. On the contrary, the MPRs in UP and Bihar are lower than the national average and that of Rajasthan and MP only somewhat higher than the national average. Paradoxically, Kerala, a much talked about state which has low birth and death rates, which is also regarded as a success story on the lines of 'good health at low cost', records the highest morbidity rate in the whole country. Punjab an economically advanced state also records high levels of morbidity. The only so called backward state which has recorded high morbidity rate is Orissa. It is however, difficult to attribute reasons for the relatively low levels of MPRs in Maharashtra, Tamil Nadu and Gujarat. The MPRs are relatively (but not significantly) higher for females in some states in rural and more so in urban areas. Again, it is difficult to hazard reasons for these differentials. However, one has to go into the detailed mapping of the factors influencing the reporting of morbidity to understand the inter-state variations, which is outside the scope of this paper.

(b) Differentials in Type and Nature of Illness Across States

Table 10 presents the incidence of morbidity according to the type of illness. Relatively speaking non-infectious sicknesses have been reported relatively less in rural areas, excepting Kerala, Karnataka and Andhra Pradesh. Kerala is unique in the sense that, the incidence of infectious

diseases is very low and least and that of non-infectious diseases is very high and highest in both rural and urban areas. The incidence of the non-infectious sickness has also been low in Gujarat, Maharashtra, Tamil Nadu and Madhya Pradesh in the rural areas. A relatively lower percentage of non-infectious episodes in rural areas may be due to the fact that many of these diseases are chronic and a larger proportion of those suffering may have been already dead. Infectious diseases are normally related to unhygienic living environments and lack of clean potable water. States with very high levels of infectious diseases are Maharashtra, Assam, Orissa, Himachal Pradesh, Gujarat and Rajasthan. As expected, however, the prevalence of infectious diseases are low in Kerala more so in its rural areas.

Table 11 present the nature of illness distribution for the selected states. Kerala again has recorded lowest incidence of gastrointestinal disorders suggesting access to better quality water in this state. On the other hand the incidence of gastrointestinal disorder is highest in West Bengal. Respiratory infection are recorded to be highest in Himachal Pradesh followed by Maharashtra and Punjab. These infections are relatively low in Assam, West Bengal and Andhra Pradesh. Fevers have been found to be very high in Madhya Pradesh, Gujarat and Uttar Pradesh. A much richer discussion on the possible reasons for inter-state differentials in type and nature of illness should include factors such as the intensity of rainfall, climatic difference, difference in cropping patterns and so on.

(c) Morbidity and Treatment Regimes

(i) Untreated Morbidity: Tables 12 presents data on untreated morbidity according to age, sex and place of residence. Overall 12 per cent of all sick persons have reported to have sought no formal treatment. However the untreated morbidity is relatively low among the young and slightly higher among the older population. Untreated morbidity is highest (17 per cent) among the oldest females living in rural areas. The lowest proportions of untreated morbidity is found among the males living in urban areas. There appears to be some suggestion that both accessibility and female bias are at work with respect to untreated morbidity. Table 13 presents distribution of untreated morbidity according to household income and place of residence. Proportion of untreated morbidity is considerably higher among the poorer households and in rural areas. Thus it suggest that both availability of health care facilities and capacity to pay for health care are at play in determining the level of untreated morbidity.

Table 14 presents untreated morbidity and hospitalisation episodes for selected states. While for all-India, about 13 per cent of the reported morbidity in rural and 9 per cent in urban areas was untreated, there are substantial differences in these proportions between states. In rural areas, 21 per cent of all episodes have reported to have been untreated in Orissa followed by 15 per cent in UP, about 14 per cent each in Karnataka and Maharashtra. The lowest untreated percentage is recorded for Punjab in which only 1.3 per cent did not resort to treatment followed by Kerala (3.8 per cent), Assam (5.9 per cent) and West Bengal (6.1 per cent). In the urban areas, the highest percentage was reported in Andhra Pradesh, followed by Karnataka, Kerala and Orissa. Whether non-treatment of sickness episodes are related to perceptions and severity of sickness or to the inaccessibility to health care facilities in terms of cost and distance needs further exploration.

(ii) Hospitalized Episodes: For all-India, 8 per cent of all morbidity episodes in rural and 10 per cent in urban areas resorted to in-patient treatment in both public and private facilities (Table 14). Hospitalisation has been fairy high in the rural areas of AP, Karnataka, Kerala, Punjab and Maharashtra; and urban areas of Maharashtra, Karnataka, HP and AP. Hospitalisation was found to be the least in rural parts of Tamil Nadu, MP and Orissa; and urban parts of MP, Assam and Orissa. It is likely that the hospitalisation is linked to both the nature of illness and distance to the service centre. Such data has also been presented in Table 14. While about one-half of all hospitalised had to travel more than ten kilometres for the rural parts of India, all those reported in Tamil Nadu, 80 per cent in HP, 70 per cent in MP, 67 per cent in Gujarat and 60 per cent in UP did so. It appears, when people suffer from chronic sickness they do travel long distances to seek hospitalisation services in rural areas. The distance information presented in this table, may not be used to substantiate the distance to the service centre differentials across states. A similar relationship has been found in urban areas as well.

(iii) Non-hospitalised (OPD) Treatment: Table 15 presents information on the non-hospitalised treatment (visit to the out-patient department) sought from the public and private facilities for the selected states. Orissa stands out where 71 per cent of all out-patients have used the public facilities, followed by Assam, Karnataka, Rajasthan and Himachal Pradesh. On the other hand in West Bengal, Uttar Pradesh, Kerala, MP, Bihar and Maharashtra out-patients approaching public facilities are relatively low.

Whether these proportions are related to the level of infrastructural development in public and private sectors or to the individual choice issue needs further exploration.

It is important to note that about 39 per cent of all rural OPD patients in HP, 34 in MP, 31 in Tamil Nadu and 26 per cent in Karnataka had to travel more than 10 kilometres to avail the out-patient services. In the states of Bihar, Orissa, Punjab and Uttar Pradesh less than 5 per cent of OPD patients travelled more than 10 kilometres to receive the public out-patient treatment. In the rural areas, while the nature of sickness pattern is similar in case of the OPD visitors to private facilities, on the whole the distance to the private facilities are lower with a few exceptions.

In the urban areas, however, the proportion of OPD seekers approaching private facilities are very high excepting in Himachal Pradesh. While the pattern of the nature of sickness being treated both in the public and private facilities was similar to the one as found in rural areas, it was found that the distance to public facilities in urban areas was much longer than the private facilities.

(iv) Where Do the Sickly Go to Seek Treatment? Table 16 presents data on the type of source of treatment (hospitalised and non-hospitalised combined) for rural and urban areas for selected states. It is startling to note that only 22 per cent in Kerala, followed by 27 per cent each in Uttar Pradesh and West Bengal, 30 per cent in Madhya Pradesh, 37 per cent in Bihar and 38 per cent in Maharashtra resorted to public facilities for treatment. Whereas, as much as 71 per cent in Orissa, followed by 65 per cent in Assam, 58 per cent in Rajasthan and 56 per cent in HP resorted to public facilities. The relatively higher proportion of public facility utilization in some states appears to be largely due to the availability of public hospital facilities. From this data it can also be safely concluded that the share of public dispensaries and PHCs providing services has been relatively higher in those states where the overall dependence on public health market is low. It is again interesting to note that the private health markets appear to serve two-thirds of the sickly in UP (almost all through small clinics), 70 per cent in Kerala and 66 per cent in AP. However, the share of private hospitals is considerable in Kerala and AP. Besides, the small private health markets seems to dominate in dispensing treatment services in Madhya Pradesh, Punjab, Maharashtra and Bihar.

In urban areas, the relative dependence on public markets is low and less variable than in rural areas. However, about 60 per cent in HP, 50 per cent

in Rajasthan, 46 per cent in Assam and 42 per cent in Karnataka depend on public health care facilities even in urban areas. These data, surely indicate to the emerging private health markets both in urban and rural parts of the country, and as we shall discuss latter that such private health markets are very expensive which are also located much farther than the public facilities. This data points to the need to thoroughly explore the reasons for low utilization of public health markets in India.

(d) Health Expenditure Differentials Across States in Rural Areas

In this survey health care expenditures incurred during the reference period were collected for each reported episode. Expenditure data was collected separately for medicines, fees paid to avail treatment, money spent on clinical tests, surgery, ward rents, special diet, rituals, transportation, bribes and tips. However, in Tables 17 and 18 expenditures only on fees and cost of medication are presented. Table 17 presents health expenditures on both hospitalised and non-hospitalised treatment according to type of facility for rural areas of the selected states. For all-India rural health expenditure for all types of categories together has averaged out to Rs. 56 per episode treatment during a 30-day reference period. Needless to say, that the expenditures on non-hospitalised treatment were considerably lower than the hospitalised and the expenditures in seeking public care was much less than when private facilities are used. For the non-hospitalised treatments, it is interesting to note that the expenditures were substantially lower when treatment was sought in public extension facilities when compared to the public hospitals. Similarly, the expenditures were much lower when treatment was sought in private clinics rather than the private hospitals. However, these data have to be put to multivariate controls to the type of sickness, severity and duration of illness so as to understand the underlying reasons for the health care expenditure differentials.

(i) Inter-state Comparison: Expenditures on Non-hospitalised Treatment: Expenditures for OPD treatments have been found to be highest in Kerala (Rs. 123) followed by AP (Rs. 120), Gujarat (Rs. 94) and Bihar (Rs. 73) (Table 17). Least expenditures were incurred by patients in Tamil Nadu (only Rs. 24) followed by Rajasthan, Orissa, MP and UP (about Rs. 41). In Kerala, the highest spender for OPD treatment, patients spend very low amounts in public extension networks than hospitals where they spend up to Rs. 150 which is highest for any state. Similarly, the expenditures in

the private hospitals for OPD was also the highest in Kerala which was Rs. 340. Thus, in Kerala about 70 per cent of all patients used private facilities and then they also pay relatively high costs for treatment of non-hospitalisation episodes.

In contrast Orissa which is next only to Kerala in the MPR but extensively (71 per cent) depends upon the public facilities for treatment and spends only Rs. 35 on an average on treatment at the OPDs. 38 per cent of all sick in Orissa have approached the public extension institutions for treatment which is the highest percentage for any of the Indian states. The cost of treatment is much lower in Orissa although those approaching the public extension services spend considerably higher amounts (Rs. 34) than those in Kerala (only Rs. 6). The cost of treatment differentials between the public hospitals and public extension institutions in Orissa is marginal. The cost of treatment in private hospitals and clinics also are much lower in Orissa.

It is important to highlight that the public health extension institutions in Tamil Nadu are dispensing health care almost free of cost. A few other states where the cost of OPD care is relatively low are West Bengal, MP, Punjab, Kerala and Karnataka.

(ii) Cost of Hospitalisation Services: Due to relatively small sample size it is not useful to discuss the private and public cost of hospitalisation in this data, albeit it can be said the cost in private facilities are very high if compared with the public hospitals. However, the combine averages among the states can be compared. It can be seen that the cost of hospitalisation services are very high in Tamil Nadu, UP, Bihar, Kerala, Karnataka, AP and Gujarat. On the other hand the cost of in-patient services are least in Punjab and West Bengal followed by Assam, HP and MP. Most of the cost differentials between states may reflect the quality and cost of non-medical services which are sold in a joint demand framework. The price differential, however, do not reflect the quality of actual medical and clinical care.

(iii) Health Care Expenditure Differentials Across States in Urban Areas and Rural-Urban Comparisons: The health care expenditure scenarios are similar in urban areas as well. However, on the whole all the respective castes are higher in urban areas. The mean expenditure only on fees and medicines has worked out to be Rs. 78 for the country as a whole. The hospitalisation costs are much higher than the non-hospitalised and the cost of care is considerably low in public facilities for both hospitalised and non-

hospitalised treatments. By far the cost of OPD treatment is the least in urban public hospitals when compared with private clinic and private hospitals. Again Tamil Nadu stands out as the OPD visitors in this state spend as little as Re.1 per episode on treating their OPD ailments. The next cheapest state to treat OPD morbidity in urban areas is MP. The cost of OPD treatment in urban Orissa, Gujarat and UP is very high in that order. Incidentally the cost of OPD treatment in urban Kerala is much lower than rural Kerala in both public and private facilities. For example, on OPD treatment the urban patients spent Rs.40 in public hospitals but spent Rs.150 in rural areas. Similarly the costs are Rs. 137 in urban but Rs. 340 in rural for treatments in private hospitals; and Rs. 53 in urban but Rs. 98 in rural for treatment from private clinics.

Other states in which the cost of public hospital OPD treatment in rural areas is more than the urban areas are AP, Bihar, Gujarat, Punjab and Tamil Nadu. The cost of private hospital OPD treatment is higher in rural areas in the states of AP, Gujarat, Haryana, Maharashtra and Punjab. Since these expenditures relate only to the cost of fees and medicines it is important to explore the reasons for this variation further.

Cost of in-patient services in urban areas are somewhat higher in MP, AP, Assam, Gujarat, Haryana, HP, Maharashtra, Orissa and Punjab. The widest differential between the rural and urban in-patient costs have been found to be in West Bengal. However, those states who recorded high inter-state expenditures in rural hospitalisation services have in fact recorded lower costs for similar services in urban areas. These states are UP and Tamil Nadu. Rajasthan which was in the middle level in rural expenditures on this account recorded much lower expenditures in the urban areas as well.

Table 19 presents the curative household health expenditure according to level of household income and place of residence. It is clear that the poorer households spend 7-8 per cent of their annual household income on health care. The relatively richer households spend only 2-3 per cent of their household income on health care. This suggests that the adverse effects of ill-health and sickness have been disproportionately higher upon the poorer section in India. The benefits of the public health care investments and free provision of primary health care appears to have not reached those who deserve them most.

VI. Determinants of Morbidity: Multivariate Analysis

It is necessary that the determinants of morbidity are understood in a multivariate context. The multivariate techniques provide the analysts opportunities to make clear distinctions between the nature and types of factors interacting in determining the dependent variable. Thus in case of morbidity, besides the individual characteristics, the household and community level factors also influence the probability of individuals to contract disease. A number of genetic and hereditary factors may also be responsible for morbidity. It is, therefore, necessary to extend our analysis into a multivariate dimension.

(a) A Production Function Specification Model to Evaluate the Incidence of Sickness

Since sickness, ill health or disease is experienced by the individual it is appropriate to explore the determinants of morbidity at the individual level. Human health or morbidity is mostly determined by three types of attributes. *(i)* Individual attributes such as the age, sex, education and so on. *(ii)* The household level attributes such as the levels of living variables, religious and caste affiliation, parental characteristics and so on. *(iii)* The third set of variables namely, environmental and policy level variables which also reflects the exogenous environmental factors such as the rural or urban living, state or region of residence, level of hygiene and sanitation, accessibility to safe drinking water, accessibility to health care facilities and so on .[4] Besides, if one has to understand the determinants of morbidity at the level of the social groups or geographic area, it is necessary to include the probability of death also into the equation. It is true that the population groups facing high risk of mortality may indeed record low risk of morbidity because of the selectivity bias. That is those who were suffering from morbidity and who could not adequately invest in treatment and health care would die and do not survive to report the morbidity. However, such data is not available in this data set.

The full specification for a health 'H' production function or morbidity 'M' production function can be of the following type:

$$H = M = (a_{ik}, hg_{ik}, he_{ik}, hm_{ik}, er_{ik}, ep_{ik}, ei_{ik}), u_{ik}$$

a_{ik} = individual attributes such as, age, sex, occupation and so on.

hg_{ik} = household level parental (genetic) attributes, such as mother's height and weight; incidence of hereditary diseases; living status of parents and age at death of dead parents.

he_{ik} = household level environmental attributes such as, religion, caste, household size, level of education of the household head, household income and so on.

hm_{ik} = household level risk of mortality (cause of death for any death during the previous five years).

er_{ik} = exogenous environmental attributes such as, rural or urban residence, population density, migration, region or state.

ep_{ik} = exogenous policy and health infrastructure, such as supply of hospitals, toilets, portable water, housing, roads, water stagnation and so on.

ei_{ik} = exogenous informational factors, such as media, newspapers, urban contacts and level of community education.

u_{ik} = unexplained error term.

Thus the health or morbidity production function can be expanded as a summation of the following type:

$$H = M = f(\alpha + \beta_{el} + \beta_{a2} + ... + \gamma_{h1} + \gamma_{h2} + ... + \theta_{e1} + \theta_{e2} + ... \theta_{an}) + u$$

In this data H = Health or (M) morbidity status is a qualitative variable measured in the form 'if reported sick' = 1, 'if not reported sick' = 0. Since health is measured in dichotomous categories of 0 and 1, an ordinary least square method of analysis is inappropriate. The meaningful analytical model for this type of dependent variable is a logit or a probit specification which estimates the probability that the dependent variable 'Y' takes a value of 1 due to an unit change in the independent variable X. That is;

$$P(Y_i = 1) = E(Y_i) = b_0 + b_1 X_i$$

The probabilities are restricted to the interval from 0 to 1. Suppose that b_1 is a positive value, then the smallest value that X_i takes on, say $X_{(1)}$, will yield a predicted probability that is greater or equal to zero. The largest value of X_i, say $X_{(n)}$, will yield a probability no larger than one (see Aldrich and Nelson, 1984). Thus,

$$0 \leq [b_0 + b_1 X_{(1)}] < [b_0 + b_1 X_{(n)}] \leq 1$$

(b) A Reduced Form Multivariate Logit Specification Model

In order to undertake a multivariate analysis the household level data from the 18,693 households was converted into a set of individual records numbering 103,245. The string of data in these individual records consists of three segments of information namely:

(i) *Individual Attributes :* Individual characteristics such as the age, sex, education and occupation of the individual.

(ii) *Household/Community Level Variables :* The second set of variable are constructed at the level of the household and community but posted along with individual attributes. For example, education level of the household head, level of income of the household and whether the household belongs to rural or urban area are these variables.

(iii) *Morbidity and Health Expenditure:* The third set of data relates to morbidity and health expenditure which is at the level of the individual. However, this string of data will be empty if a particular individual is not sick.

The analysis is undertaken at the level of all-India and the state level variations are highlighted by introducing state level dummies for selected states for whom a reasonable sample of households existed. Logistic specifications have been employed as the multivariate tool and the analysis was done by using a combination of the SPSS, LIMDEP and STATA software packages.

In this analysis all the relevant variables for which data was available were first transformed into suitable recoded interval categories and then these categories were converted into 'dummy' formats of **'no=0' and 'yes=1'**. These variable transformations were necessary because this analysis intends to translate the logit effects into user friendly 'relative risks' and 'odd ratios'.

Although, for a complete and thorough understanding of the determinants of morbidity a production function of the type presented in Chapter V, Section (a) may be necessary, such an analysis could not be undertaken because of the non-availability of data. However, the following variables were used to specify various combinations of reduced form equations whose results are presented below. The variables presented below have been carefully selected after testing for possible multicollinearity.

List of Selected Variables:

Age of the Individual : recoded in five broad age groups, namely 0-4 years, 5-14 years, 15-34 years, 35-59 years, and 60 and above years.

Sex of the Individual : male=1, female=0.

Education Level of the Household Head : up to middle, middle to secondary level, secondary and above level.

Religion: if Hindu=1, others=0.

Scheduled Castes/Scheduled Tribes: if SCs/STs=1, others=0.

Annual Household Income: up to Rs. 18000, 18001-36000, 36001-56000, 56001-78000, above 78000.

Household Size: up to 4, 5-7, 8 and over.

Place of Residence: if urban=1, rural=0.

States: sixteen major states.

(c) Relative Risks (RRs) of Morbidity

The relative risks 'RRs' have been estimated from the logit coefficients which evaluates the inter-group prevalence of sickness. Table 20 presents the RRs for the total sample population and for the five broad age groups. From the cross-tabulation analysis we know that age of the individual is one of the dominating variables influencing the risk of morbidity. Therefore, it is necessary to know the type of effects the selected independent variables have on the morbidity after controlling for the effects of other variables included in the equation.

At the all-India level, it can be observed that there is a falling and then an increasing trend in morbidity by age (note that the omitted or reference category is normalized to the value of 1). Grown up children between 5-14 years of age and persons in 15-34 years category have recoded lowest risks when compared with the reference category of 0-4 year old. As expected the risk is 65 per cent higher for those who are over 60 years of age. The incidence of morbidity which is high during infancy consistently declines and reaches a minimum by the age of 20 years and again raises. These results supports the above figures and again conforms the *J* shaped association expected between age and morbidity. This association is highly significant and on the expected lines.

On the whole males have a five per cent advantage over the females and surprisingly SCs/STs also have a five per cent advantage over the all other population. Household income has a clear and significant negative relationships with morbidity. Contrary to the expectation this data does not show differentials in risk of morbidity by the level of education of the head of the household (although we found a negative association in the bivariate analysis), place of residence and religion.

When compared with the reference category of Kerala the RRs for most of the states are significantly low suggesting very high morbidity levels in Kerala. Only Orissa has shown the morbidity level as high as Kerala.

(i) Relative Risks of Morbidity According to Age Groups: It is instructive to note that a 19 per cent relative advantage for female children in 0-4 years of age is almost lost in the 5-15 age group and in the 15-34 and 34-59 age categories it turns to 11 and 16 per cent disadvantage. Highly significant high risks of morbidity for females in the 15-34 and 35-39 age categories have important implications to the current debate on reproductive health.

Although there was a negative association between household head's education and morbidity in the cross-tabulation analysis, this association is not found to be significant in the multivariate logit analysis for total population. However, the age-specific logit analysis presents some very important relationships between the education and morbidity prevalence. In the 0-4 years age category, the RRs are significantly larger for the successive higher education categories (51 and 82 per cent higher). This suggests that as the level of household education improves the reporting of the infant and child morbidity also improves. This indeed is a reflection of the allocation of better child care inputs and accurate (higher) reporting of child morbidity by the educated adults. However, in the subsequent age groups, the RRs usually fall as the level of household head's education increases and most of these associations are statistically significant. The results relate to the 0-4 and 15-34 year age categories can be taken to present closer to true picture with respect of morbidity reporting.

Another instructive evidence emerging is that in the 0-4 age category Hindus have substantial advantage (30 per cent) while the SCs/STs have a 25 per cent disadvantage with regard to the risk of morbidity. This association is almost exactly reversed in 5-14 and 35-59 age categories where the SCs/STs show low relative risks. In the subsequent analysis of RRs according to regions suggest that the morbidity risks for SCs/STs are

lower in the states of Madhya Pradesh, Maharashtra, Rajasthan, UP and Bihar. This finding, however, needs a thorough and in-depth probing.

The overall association between household income and morbidity is negative and significant. This highly significant negative association is contributed substantially by the 0-4 years age category. For example, RRs are 21 per cent, 30 per cent, 46 per cent and 53 per cent lower in successive higher income categories among the young population. Most of the relationships in other income categories are not significant excepting in oldest group. The place of residence does not show significant relationship in any of the age categories.

(ii) Risk of Morbidity and Household Size: Household size is an important dimension to understand the incidence of morbidity in the Indian socio-cultural context. The epidemiological research has indicated that the incidence of morbidity can increase as the household size increases. This is especially so if the communicable diseases are common. Therefore, it is expected that in India the incidence of morbidity should increase as household size increases. However, this analysis suggests that the probability of sickness is the highest in single person households. This probability is significant and consistently falls so as to reach a minimum when the size is of about 16 members and then increases. There is almost linear and negative relationship between sickness and household size. The RRs are also substantially and significantly lower in all the age group categories more so in the 0-4 years of age. This association gets confirmed by a simple cross-tabulation analysis. For example, the reported morbidity during the reference period is 454 per thousand among the single person households followed by 209 in two-person, 146 in three-person, 113 in four-person and 98 in five-person households.

Thus there appears to be a morbidity reporting bias according to household size. There is a possibility that the reporting of sickness is better in smaller households and the interviewee in the large households may miss out on reporting simpler and shorter sicknesses relating to other household members. The survey instruments are normally canvassed to an adult member of a household who may miss out reporting the simpler and less serious sickness of other household members. This bias is likely to increase as the household size increases. If such an error exists in this data set then it is not prudent to emphasize the positive relationship between morbidity and household size. Does this problem in data affects the validity of other relationships, especially those which are correlated with household size.

The correlation coefficients between household size and other socio-economic variables such as household income, occupation, education are generally less than 0.5 in this data which may not affect the validity of other results discussed below. Besides, the logit analysis used in this analysis presents the pure and independent effects controlling for all other variables specified in the model. Is it likely that due to this problem the morbidity incidence is underestimated among the poor? This data was also evaluated to find out the age structure differentials by household size and household income groups. It is true the large households within low income categories have relatively younger population, but this group is too small to influence the overall results substantially. As has been discussed in Tables 4, 5 and 6 there is no evidence to substantiate this association.

(iii) Risk of Morbidity and Household Income: The RRs presents a linear and inverse association between income and morbidity. Individuals living in households with Rupees 18-36 thousand category have 8 per cent followed by 36-56 thousand have 10 per cent, 56-78 thousand category have 13 per cent and above 78 thousand have 14 per cent advantage over the lowest category of below 18 thousand category. It may also be noted that the mean annual household income has worked out to be about Rs. 42157 for the total sample. This appears to be relatively higher than expected, but it is likely because two-thirds of the surveyed households belong to urban areas which generally have relatively higher incomes. In a different probity analysis (results not presented), household income was introduced as a continuous variable with a square term as well. The coefficients suggest an almost linear, negative and significant relation between the two variables. As income increases the incidence of morbidity decreases. It was estimated that about a twenty five per cent increase in household income, at the level of its mean, reduces the risk of morbidity by about one per cent. The square term only confirms this association. It appears that relatively richer individuals and households would invest more on maintaining their personal and household hygiene and sanitation, and consume better nutrition which may reduce the risk of infection and subsequent morbidity. This negative and significant association between levels of living and morbidity makes a case for reducing the intra-group income inequalities rather than a policy construct to uniformly augment household income which would be unrealistic in a developing country such as India.

(iv) Relative Risk Differentials by Sex and Place of Residence: Table 21 presents the RRs for rural and urban areas and for females and males

separately. The male advantage in the risk of morbidity is restricted only to the urban areas and the impact of education of the household head is also found to be significant only in urban areas. The other associations stay similar to those discussed with respect to the total population. Similarly the RR is found to be significantly lower only among the SCs/STs women. However, this may even be due to reporting errors which needs careful study. Other relationships remain unchanged for the logit models based on sex as well.

(v) Relative Risk Differentials for Selected States: Sixteen major states were selected to be studied in the multivariate context. Each state was introduced in a dummy format and Kerala was excluded as a reference category. Since the morbidity estimates for the state of Kerala are the highest when compared to all other states (excepting Orissa), the RRs have been significantly lower compared to Kerala. For example, Tamil Nadu and Gujarat have recorded only about 37-38 per cent risk of morbidity compared with Kerala. Similarly in Bihar and UP the risks are 56 and 58 per cent of the level of Kerala. However, in the absence of a thorough analysis of the possible factors influencing the reporting of morbidity in different states it is not very useful to hazard the possible reasons for the inter-state variation in morbidity. On the whole however, the states located in western region (Maharashtra and Gujarat) have recorded the lowest morbidity risks followed by those in South other than Kerala. Lower risks of morbidity in the populous and so called backward states located in central and northern region are surprising.

A separate analysis was undertaken to understand whether the relative influence of the independent variables vary in different regions of India (Table 22). Practically all the advantage of RRs for males has come over from one region namely 'lower central' which includes MP, Orissa and Rajasthan. Women in these states have an unreasonably high morbidity risks when compared with their sisters in other states. The direction and significance of RRs according to age follows the expected and uniform pattern although the levels differ between the regions. Although, the impact of education was not significant in the total sample population, education does have significant effects in reducing the risks in South and Upper Central region (UP and Bihar) and increasing the risks in Western region. The RRs for Hindus is considerably high only in the Lower Central region consisting of Rajasthan, Madhya Pradesh and Orissa. The RR for SCs/STs has been found to be 15 per cent higher in Southern states and considerably

lower in both Upper and Lower Central States. Western region records substantial variation in RRs according the income levels. All the successive income categories have recorded considerably lower risks when compared with the reference category. The relative absence of RR variations in Central, Northern and Eastern regions points to the predominant impacts of the almost uniform environmental, infrastructural and policy factors prevalent in these regions. Similarly, the impact of urban living is manifest only in the western regions where it is positive, and in UP and Bihar where it is negative.

(d) Determinants of Hospitalised Treatment

Just about 8.5 per cent of all those who reported sickness during the reference period 30 days prior to the date of survey have utilized hospital in-patient service. The odds ratios with regard to determinants of hospital care are presented in Table 23. Age of the sick person shows a highly significant, positive and increasing relationship with hospitalisation more so in the urban areas. We know from the analysis above that incidence of sickness is in fact higher among the young but the rate of hospitalisation is low even after controlling for the effects of the type of illness. Similarly, males are 38 per cent more likely in rural and 57 more likely in urban areas to seek hospital services when sick (even after controlling the effect of severity of sickness). This clearly indicates female bias, as there has been no noteworthy difference in the type and nature of sickness faced by the males and females. In fact females in the reproductive ages do face high morbidity which may require more of the hospitalisation services. This clearly reflects upon the age and gender based discrimination which exists both in rural and urban areas in India.

The hospitalisation rates are almost twice among the highly educated households in rural areas as opposed to the least educated, but this education advantage is not found in the urban areas. SCs/STs have used the hospitalisation services less and the results are significant at below 10 per cent levels. Household income shows almost no significant effects on hospitalisation in both rural and urban areas, suggesting that decisions to seek in-patient treatment is not determined by economic status. In the determinants of hospitalisation equation two variables, namely, nature of illness and distance to the hospital were introduced as additional controls. The rates of hospitalisation are 2 to 4 times higher in case of infectious and non-infectious sickness when compared with unspecified fevers which is

the reference category. The distance variables suggests that people do travel long distances especially in the rural areas to seek hospital services. The odds that a patient travels 10 kms. and above to seek hospital treatment is about 20 times higher. The public sector hospitalisation services are sought after more frequently both in the rural and urban areas. For example, the odds that sick persons approaches a public hospital is 2.7 times higher in rural and 3.4 times higher in urban areas respectively. The choice of public facilities may be due to the fact that cost of hospitalisation is relatively low in public hospitals.

Data also suggest that the in-patient hospitalisation care increases as the household size increases in urban areas. It appears that the reporting of serious sickness and also those involving hospitalisation are better reported by respondents belonging to larger households. It is likely that simpler and non-hospitalised morbidity has been under reported in the larger households.

There are also regional variations in the hospitalisation practices. When compared to the state of Kerala hospitalisation are significantly higher in Punjab (2.8 times) followed by Bihar (2 times higher). On the other hand the hospitalisation is significantly low in Madhya Pradesh and Himachal Pradesh. Whether these inter-state variations are due to supply or demand factors needs further probing.

(e) Determinants of the Choice of the Type of Treatment Facility

The survey collected information on the people's choice of the place of treatment such as the public and private facility when sick. The odds ratios with regard to the choice of treatment are also presented in Table 23.

About 32 per cent of those who reported sickness have resorted to treatment from the public, mainly allopathic services. Age of the sick person seems to have no effects on the choice of a place of treatment, although males in urban areas choose public facilities more often. The effect of education is also not that prevalent although the well educated in urban areas do prefer to use private facilities more frequently, the odds that they use public facilities is only 0.64. However, both the Hindus and the SCs/ STs in urban areas have utilised public services in a significant way. As expected household income has the largest effects in the choice of services more so in urban areas. The odds people chose public facilities are 0.68, 0.56, 0.51 and 0.40 for the successively increasing household income categories in urban areas and these are highly significant associations.

People suffering from infectious sickness in rural and non-infectious sickness in urban have utilised the public services relatively more often.

The choice of public facilities in the rural areas are substantially higher in Orissa, Rajasthan, Assam, Punjab and Karnataka than the reference state of Kerala. But this choice is low in West Bengal. In the urban areas the choice of public facilities are relatively higher in Rajasthan, Punjab and Assam and it is low in Uttar Pradesh and Tamil Nadu.

VII. Summary and Discussion

A number of very useful associations get highlighted in this morbidity analysis. At the outset two individual attributes namely, sex and age of the individual show important associations with morbidity. The results highlight extremely high levels of morbidity prevalence among the very young (0-4 years) and the very old. A further disaggregation suggests that most of the male advantage in morbidity comes from the 15-34 and 35-59 age categories thus pointing to a very high reproductive morbidity among the Indian women. A higher natural resistance of females to the risk morbidity in the younger ages is apparent which gets converted to very high level of risks in subsequent ages, mostly emerging out of the socio-behavioural factors. A regional level disaggregation points to a substantial and significant female disadvantage in the three lower-central states namely, Rajasthan, Madhya Pradesh and Orissa. Further, contrary to the expectation the female disadvantage is high and significant in the urban areas.

Another remarkable finding of this analysis is the apparent lack (not significant) of education effect on the risk of morbidity. But the disaggregated analysis indeed presents an entirely different picture. The education of the household head has large, positive and highly significant association with morbidity of children less than 5 years of age. In the subsequent ages, however, the association is negative and in many places significant. This analysis, indeed points us to think that to understand the true effects of mass education on morbidity and other demographic parameters, it needs deeper quantitative as well as qualitative efforts. For example, only one analysis at the level of India would have lead us to a misleading conclusion that 'education was not significantly important in the determinant of morbidity', while the truth is opposite and also multidimensional. It must also be noted that practically all the positive association between education and morbidity is emerging out of the two well developed and educationally forward states of Maharashtra and Gujarat. Reasons for the lack of these associations among the other states, however, needs further exploration.

Another noteworthy conclusion drawn from this analysis is a fairly clear negative and significant effects of household income on morbidity. The magnitude of this association is larger and much stronger among the younger population. Thus it is true that households having relatively higher incomes may invest relatively more in health producing and morbidity inhibiting goods and services. To that an extent the relatively poorer

sections of the population appear to be bearing a disproportionately higher morbidity load and associated discomforts.

This analysis clearly highlights age and gender based discrimination with regard to the utilization of hospitalisation services both in rural and urban areas. The very young persons are less likely to get hospitalised for the treatment of sickness (even after controlling for the nature of sickness), when compared with the middle age adults. When compared to those suffering from fevers, persons suffering from infectious and non-infectious sickness have used in-patient treatment in considerable proportions in all parts of the country. There is also the tendency to choose public hospitals for hospitalisation services is also significant and large. The rate of hospitalisation is significantly low in central and eastern parts and significantly high in western parts when compared with South India. Those living in urban areas also utilize hospital more frequently than those from the rural areas.

As expected the relatively well off and relatively well educated choose private facilities for treatment of sickness. Women in productive ages also have a tendency to resort to private health care in all parts of India. The public health care utilization is relatively high in case of Hindus, those living in eastern parts of India and those suffering from infectious sickness in rural and those from non-infectious in urban areas. As distance to the service centre increases resort to public facilities declines when compared with the private services.

It appears that India's ongoing health transition still in a stage in which the individual level variables are showing a considerable influence on morbidity. The so called household/community level or environmental variables are beginning to extend substantial explanatory support in explaining the variations in morbidity. It is important to keep a track of the relative importance of individual versus the community/environmental variables in the determinants of morbidity. The policy options and investment choices should necessarily differ depending upon the relative influences extended by the levels of variables on morbidity.

Morbidity research in India is of recent origin. Thus far little was known regarding the disease profile, its incidence, prevalence and distribution. The hospital admission and cause of death statistics from the hospital records have been used to highlight the disease profiles. Such information

do not truly present the community burden of diseases and sickness. The National Sample Survey Organization collected community level information on hospitalised episodes in its 38th round sample survey during 1989-90. Subsequently the NCAER 1990 Survey collected community level data on the treated morbidity. However, the NCAER 1993 Survey improved upon both these surveys so far as it collected all types of morbidity including untreated and hospitalised episodes. NCAER 1993 Survey is one of the rare efforts to present an all-India as well as the state level scenario regarding the prevalence of morbidity. This Survey has estimated a MPR of 104 for the rural and 101 for the urban areas for all-India during a reference period of 30 days previous to the date of survey. We certainly know the actual morbidity may be much more than what has been netted in this survey. Efforts should therefore be made to standardise the concepts, definitions and reference periods so as to estimate more accurate morbidity rates.

It is nevertheless emphasized that the current multivariate model specifications were formulated so as to maximize the utilization of data already existing from the survey. Data on many types of community level health producing and health inhibiting variables, such as, quality of drinking water, level of household and community level sanitation and hygiene, access to nutrition and so on are not available from this survey. Such data is especially important to present comprehensive explanations in morbidity variation according to social, geographic and economic groups. Efforts should, therefore, be made to standardize the nature and type of data which needs to be collected to understand the complexities of the determinants of morbidity and associated health seeking behaviour. Further research is needed to perfect methodologies to collect scientifically dependable and culturally sensitive disease specific information through the lay-reporting techniques developed especially to suit the Indian conditions. Emphasis on collecting such data should be the aim as such information is important not only to present socio-economic differentials in morbidity load but also to present a regional picture. Disaggregated morbidity information will also be necessary for policy decision-making in setting the priority areas for both the public and private funding of infrastructure, research and development, training and manufacturing the health producing goods including drugs and medicines.

Table 1. Distribution of the Sample Population According to Age, Sex and Place of Residence, All-India

Age Groups	*All*			*Rural*			*Urban*		
	All	*Female*	*Male*	*All*	*Female*	*Male*	*All*	*Female*	*Male*
0-4 yrs	8.2	8.6	7.9	8.7	9.2	8.2	7.0	6.9	7.0
5-14 yrs	23.7	22.9	24.4	24.4	23.6	25.0	22.0	21.2	22.7
15-34 yrs	37.3	38.2	36.5	36.8	37.5	36.2	38.7	40.0	37.5
35-59 yrs	25.7	25.2	26.2	25.2	24.6	25.6	27.3	26.7	27.8
Above 60	5.0	5.1	5.1	5.0	5.1	4.9	5.1	5.2	5.1
ALL	**100.0**	**(46.1)**	**(53.91)**	**100.0**	**(45.9)**	**(54.1)**	**100.0**	**(46.8)**	**(53.2)**

Table 2. Percentage Distribution of Individuals According to Household Income, Place of Residence, Education Level of the Household Head and Household Size

Household Income (Rupees)	*All*			*Head's Education*			*Household Size* (Members)		
	All	*Rural*	*Urban*	*Upto Middle*	*Mid-HSC*	*HSC+*	*Upto 4*	*5 - 7*	*8 +*
Upto Rs. 18000	56.4	63.4	37.2	72.6	48.6	26.1	63.7	57.9	45.0
Rs. 18001-Rs. 36000	26.3	23.9	32.9	20.5	32.1	31.4	23.8	27.1	27.3
Rs. 36001-Rs. 56000	10.0	7.8	15.8	4.6	12.1	20.9	7.4	9.1	14.7
Rs. 56001+	7.4	4.9	14.1	2.2	7.2	21.7	5.0	6.0	12.9
ALL	**100.0**	**(73.3)**	**(26.7)**	**49.1**	**(33.0)**	**(17.9)**	**(25.9)**	**(50.7)**	**(23.4)**

Table 3. Morbidity Prevalence Rate According to Sex, Place of Residence and Socio-Economic Characteristics

Socio-economic Characteristics	*All*	*Rural*	*Urban*	*Female*	*Male*
All	103	104	101	105	101
Female	105	105	106	---	---
Male		101	102	96	---

Rural	104	---	---	105	102
Urban	101	---	---	106	96
Age Groups					
<5	135	134	139	125	145
5-14	78	80	73	73	82
15-24	84	86	79	89	79
35-59	125	125	124	136	116
60+	195	190	208	188	201
Head's Education					
Illiterate	127	126	143	129	126
Up to Middle	104	103	107	104	103
Secondary & Higher Secondary	98	97	101	103	94
Higher Secondary +	98	105	92	102	95
Household Income (Rs.)					
<18000	109	109	113	111	108
18000-36000	98	98	98	102	94
36001-56000	91	90	93	95	88
56001-78000	89	89	89	92	86
Above 78000	80	81	78	84	76
Per Capita Income (Rs.)					
< 2000	97	97	98	95	98
2001-3500	102	104	93	102	101
3501-6000	107	109	103	115	101
6001 +	109	113	104	115	104
Religion/Caste					
Hindus	103	103	101	106	100
Muslim	82	80	85	83	81
SC/ST	101	102	97	102	100
Household Size					
<5	137	139	133	149	127
5-7	99	101	91	169	97
8+	74	74	75	69	78
Geographic Region					
South	114	116	109	112	116
West	73	69	80	75	71
Upper Central	100	103	86	100	100
Lower Central	127	125	134	137	119
East	80	81	78	85	77
North	113	109	119	121	106

Table 4. Morbidity Prevalence Rate According to Household Size, Household Income and Place of Residence

Household Income (Rupees)	*Upto 4 members*			*5-7 members*			*8 and above*			*All*
	All	*Rural*	*Urban*	*All*	*Rural*	*Urban*	*All*	*Rural*	*Urban*	
Upto 18000	145	145	146	102	103	98	74	73	82	109
18001-36000	123	122	124	96	100	90	77	77	76	98
36001-56000	128	129	127	89	94	83	74	73	77	91
56001-78000	121	133	115	96	102	90	65	66	64	89
78001 +	103	100	104	87	96	81	66	70	59	80
ALL	**137**	**139**	**133**	**99**	**101**	**91**	**74**	**74**	**75**	**103**

Table 5. Morbidity Prevalence Rate According to Household Size, Per Capita Income and Place of Residence

Per Capita Income (Rupees)	*Upto 4 members*			*5-7 members*			*8 and above*			*All*
	All	*Rural*	*Urban*	*All*	*Rural*	*Urban*	*All*	*Rural*	*Urban*	
Upto 2000	134	135	123	102	102	104	72	71	81	97
2001-3500	142	147	123	99	101	91	74	74	74	102
3501-6000	136	134	140	99	103	91	77	77	75	107
6001 +	137	142	132	92	98	86	73	79	64	109
ALL	**137**	**139**	**133**	**99**	**101**	**91**	**74**	**74**	**75**	**103**

Table 6. Morbidity Prevalence Rate According to Age and Sex, Per Capita Income, Household Size and Place of Residence

	All			*Household Income* (Rs.)					*Household Size* (Members)		
	All	*Rural*	*Urban*	*Upto-18000*	*18001-36000*	*36001-56000*	*56001-78000*	*Above 78000*	*Upto 4*	*5-7*	*8 +*
0-4 yrs Female	125	123	129	131	123	109	98	84	197	108	99
0-4 yrs Male	145	144	147	165	123	121	90	66	192	144	110
5-14 yrs Female	73	75	68	81	57	71	58	63	122	77	31
5-14 yrs Male	82	83	77	91	69	65	78	52	104	82	60
15-34 yrs Female	89	90	88	97	88	71	68	48	127	84	52
15-34 yrs Male	79	82	70	86	77	67	56	52	108	76	50
35-59 yrs Female	136	136	136	140	137	119	119	129	173	127	104
35-59 yrs Male	116	117	113	123	112	101	102	102	133	111	102
60 yrs + Female	188	199	209	177	195	213	237	167	254	186	151
60 yrs + Male	201	102	106	193	201	222	234	200	280	193	168
ALL FEMALE	*105*	*105*	*106*	*111*	*102*	*95*	*92*	*84*	*149*	*100*	*69*
ALL MALE	*101*	*102*	*96*	*108*	*94*	*88*	*86*	*76*	*127*	*97*	*78*
ALL	**103**	**104**	**101**	**109**	**98**	**91**	**89**	**81**	**137**	**99**	**74**

Table 7. Type of Illness Distribution According to Socio-economic Characteristics

Socio-economic Characteristics	*Infectious*	*Non-Infectious*	*Fevers/ Others*
All	34.0	27.5	38.6
Females	31.7	31.0	37.3
Males	36.0	24.3	39.7
Rural	33.8	25.9	40.3
Urban	34.4	31.8	33.8
Age Groups (Years)			
<5	52.2	5.1	42.7
5-14	41.8	11.2	47.0
15-34	22.0	26.9	41.1
35-59	28.6	38.4	33.0
60+	22.5	49.5	28.0
Head's Education			
Illiterate	35.0	21.9	43.1
Upto Middle	36.2	25.5	38.3
Sec.+ Hr.Sec.	32.6	28.5	38.9
Hr.Sec.+	30.6	33.5	35.8
Household Income (Rs.)			
<18000	34.0	25.5	40.5
18000-36000	34.4	30.4	35.3
36001-56000	35.4	28.3	36.3
56001-78000	31.1	31.5	37.4
Above 78000	28.5	36.4	35.1
Per Capita Income (Rs.)			
< 2000	34.0	26.9	39.1
2001-3500	35.4	25.3	39.3
3501-6000	33.9	28.2	37.9
6001 +	32.2	30.2	37.6
Religion/Caste			
Hindus	33.8	27.9	38.3
Muslims	36.4	29.6	34.0
SCs/STs	35.3	24.1	40.6
Household Size			
1-4	34.7	36.4	38.9
5-7	33.9	26.7	39.3
8+	32.5	31.6	35.8
Geographic Region			
South	28.7	35.8	35.5
West	43.2	21.0	35.8
Upper Central	33.3	22.8	43.8
Lower Central	33.4	24.4	42.2
East	39.7	30.2	30.1
North	36.6	31.3	32.1

Note: Fevers constitute more than 90% in this category.

Table 8. Nature of Illness Distribution According to Socio-economic Characteristics

Socio-economic Characteristics	*Gastro intestinal*	*Respi-ratory*	*Fever*	*Heart/ Renal*	*Unclassi-fied*
All	16.9	15.6	36.8	6.6	24.1
Female	17.5	15.3	37.0	7.8	22.5
Male	16.5	15.9	39.6	5.5	22.6
Rural	17.4	15.3	39.7	5.4	22.1
Urban	15.7	16.4	34.5	9.8	23.6
Age Groups (Years)					
<5	22.6	20.3	44.1	0.7	12.4
5-14	17.7	15.6	46.2	1.2	19.4
15-34	17.6	12.3	42.8	5.6	21.7
35-59	15.5	15.9	29.0	10.2	29.3
60+	11.8	19.7	17.1	14.6	26.8
Head's Education					
Illiterate	18.3	17.3	40.3	3.0	21.2
Up to Middle	18.1	16.5	37.8	4.6	23.0
Secondary & Hr.Secondary	16.4	14.7	36.6	8.3	24.1
Hr. Secondary+	14.4	13.9	32.5	10.4	28.7
Household Income (Rs.)					
<18,000	17.4	15.6	38.1	5.5	23.4
18000-36000	16.7	16.1	34.7	7.7	24.8
36001-56000	16.8	15.5	34.7	7.7	25.4
56001-78000	13.1	14.8	35.9	9.7	26.4
Above 78000	14.0	13.4	33.6	13.3	25.7
Per Capita Income (Rs.)					
< 2000	19.1	16.0	39.7	4.5	20.6
2001-3500	18.0	14.5	38.9	6.1	22.6
3501-6000	15.1	16.4	37.9	7.5	23.1
6001 +	14.6	15.4	36.1	9.2	24.6
Religion/Caste					
Hindus	17.1	15.6	36.3	6.7	24.3
Muslims	18.1	14.9	32.4	8.2	25.3
SCs/STs	18.4	14.8	37.5	4.1	25.1
Household Size					
<5	16.4	16.1	37.8	6.9	22.8
5-7	16.5	15.2	36.8	6.6	24.9
8+	19.3	15.7	34.5	6.0	24.5
Geographic Region					
South	14.4	15.4	31.2	9.9	29.1
West	12.9	21.1	38.5	6.0	21.6
Upper Central	19.1	14.0	42.6	5.0	19.4
Lower Central	15.5	15.9	40.6	3.7	24.3
East	26.3	10.6	28.5	9.0	25.6
North	17.7	19.4	30.3	8.0	24.7

Table 9. Morbidity Prevalence Rate Per 1000 Persons According to Sex and Place of Residences for Selected States

	All			*Rural*			*Urban*		
	All	*Female*	*Male*	*All*	*Female*	*Male*	*All*	*Female*	*Male*
Andhra Pradesh	127	124	130	121	111	129	137	143	132
Assam	83	79	86	85	81	89	65	65	64
Bihar	99	98	99	98	98	98	102	98	106
Gujarat	78	84	72	75	78	72	84	94	74
Haryana	77	79	77	74	71	76	87	98	77
Himachal Pradesh	149	169	130	146	166	127	178	204	156
Karnataka	109	107	111	116	110	122	93	101	87
Kerala	181	177	185	183	181	185	175	166	185
Madhya Pradesh	112	114	110	110	114	107	117	113	121
Maharashtra	70	71	70	66	67	65	78	79	77
Orissa	175	204	150	177	209	149	163	172	156
Punjab	134	127	140	129	106	150	145	175	119
Rajasthan	119	128	111	109	116	103	150	166	137
Tamil Nadu	77	77	77	78	79	78	75	74	75
Uttar Pradesh	101	101	101	107	106	107	79	82	77
West Bengal	80	88	74	80	87	75	81	88	73
ALL-INDIA	**103**	**105**	**101**	**104**	**105**	**102**	**101**	**106**	**96**

Table 10. Percentage Distribution of Morbidity by Type of Sickness and Place of Residence for Selected States

	Rural			*Urban*		
	Infec-tious	*Non-infectious*	*Fevers*	*Infec-tious*	*Non-infectious*	*Fevers*
Andhra Pradesh	32.3	37.8	29.9	26.8	36.6	36.6
Assam	45.6	27.3	27.1	38.0	32.8	29.1
Bihar	40.7	20.0	39.2	41.3	23.9	34.9
Gujarat	38.2	13.5	48.3	44.8	27.2	27.9
Haryana	36.0	29.2	34.8	38.5	31.5	30.0
Himachal Pradesh	41.4	34.3	24.3	22.6	55.4	22.0
Karnataka	27.1	37.7	35.5	34.7	30.8	34.4
Kerala	16.8	43.7	39.5	29.5	42.3	28.2
Madhya Pradesh	24.5	18.2	57.3	32.5	22.8	44.7
Maharashtra	47.2	17.0	35.8	40.4	29.2	30.4
Orissa	41.9	30.7	27.3	36.1	37.7	26.2
Punjab	37.4	25.9	36.7	45.3	20.9	33.7
Rajasthan	38.0	22.9	39.1	35.0	30.3	34.6
Tamil Nadu	37.6	19.5	42.9	32.3	39.7	27.9
Uttar Pradesh	28.6	23.9	47.5	30.5	25.5	44.0
West Bengal	39.3	29.8	30.9	33.4	35.3	31.3
ALL-INDIA	**33.8**	**25.9**	**40.3**	**34.4**	**31.8**	**33.8**

Table 11. Percentage Distribution of Morbidity in Rural Areas by Nature of Sickness in Selected States

	Gastro-intestinal	*Respi-ratory*	*Fevers*	*Heart/ Renal*	*Others*
Andhra Pradesh	18.0	11.8	31.6	8.3	30.2
Assam	20.7	8.4	36.5	15.1	19.1
Bihar	18.3	17.3	38.2	5.2	21.0
Gujarat	12.9	14.9	50.1	4.6	17.5
Haryana	18.3	12.0	29.4	10.2	30.1
Himachal Pradesh	18.6	27.4	20.3	7.2	26.6
Karnataka	13.9	16.4	36.6	10.0	23.0
Kerala	8.9	17.3	25.5	15.3	33.7
Madhya Pradesh	13.3	14.4	51.3	3.0	18.1
Maharashtra	12.9	24.1	32.7	6.7	23.6
Orissa	15.2	19.2	26.8	4.4	34.3
Punjab	12.7	23.9	38.3	5.3	19.7
Rajasthan	19.6	15.1	37.2	4.2	23.9
Tamil Nadu	17.0	16.7	31.1	6.0	29.2
Uttar Pradesh	19.5	12.0	45.2	4.8	18.5
West Bengal	28.4	11.3	25.7	6.9	27.7
ALL-INDIA	**16.9**	**15.6**	**36.8**	**6.6**	**24.1**

Table 12. Distribution of Those Sick Persons Who Did Not Resort to Any Treatment by Age and Place of Residence

Age Groups (Years)	*All*			*Rural*			*Urban*		
	All	*Female*	*Male*	*All*	*Female*	*Male*	*All*	*Female*	*Male*
Upto 4	9.7	10.0	11.5	11.4	11.1	12.1	8.0	6.2	9.4
5-14	9.3	9.5	9.2	9.6	9.4	9.9	8.2	9.8	7.0
15-34	13.2	12.9	13.6	14.4	13.4	14.9	9.9	10.2	9.6
35-59	12.5	12.2	12.7	13.9	12.9	14.7	8.9	10.4	7.4
Above 60	13.2	15.7	11.0	14.3	17.4	11.9	10.3	11.9	8.8
ALL	**12.0**	**12.1**	**12.0**	**13.0**	**12.8**	**13.2**	**9.2**	**10.1**	**8.3**

Table 13. Distribution of Those Sick Persons Who Did Not Resort to Any Treatment by Household Income and Place of Residence

Household Income (Rupees)	*All*			*Rural*			*Urban*		
	All	*Female*	*Male*	*All*	*Female*	*Male*	*All*	*Female*	*Male*
Upto 18000	13.4	13.5	13.5	13.0	13.6	14.6	10.3	11.9	8.6
18001-36000	11.1	11.2	11.1	11.5	12.6	11.6	9.7	9.2	10.3
36001-56000	7.8	8.9	6.9	8.2	9.5	7.7	7.0	8.1	5.7
56001-78000	9.4	10.5	8.3	10.7	11.0	11.7	7.5	10.0	5.0
Above 78001	5.7	5.7	5.8	5.9	5.4	5.4	6.4	5.9	4.7
ALL	**12.0**	**12.1**	**12.0**	**13.0**	**12.8**	**13.2**	**9.2**	**10.1**	**8.3**

Table 14. Percentage Distribution of Untreated Episodes and Hospitalised Cases by Place of Residence and Distance to Hospital for Selected States

States	*Sick Who Did Not Seek Treatment*		*Hospitalised*		*Distance to Any Hospital* (Kms.)	
	Rural	*Urban*	*Rural*	*Urban*	*Rural 10 +*	*Urban 6 +*
Andhra Pradesh	12.6	16.1	13.9	14.1	29.2	6.9
Assam	5.9	2.9	7.5	4.5	8.3	0.0
Bihar	11.6	7.3	9.2	9.3	28.6	9.1
Gujarat	7.3	9.3	6.7	9.2	66.7	0.0
Haryana	8.2	7.8	13.3	10.9	41.7	15.4
Himachal Pradesh	5.9	6.8	10.5	15.9	80.0	10.0
Karnataka	13.8	11.9	8.0	16.3	46.2	16.9
Kerala	3.8	10.8	13.2	8.1	53.3	20.0
Madhya Pradesh	8.9	3.9	4.2	4.2	70.8	20.0
Maharashtra	13.5	4.3	11.3	19.4	53.8	8.8
Orissa	21.1	10.2	6.3	6.6	11.1	0.0
Punjab	1.3	7.9	12.0	10.7	40.0	6.7
Rajasthan	10.7	6.1	8.1	7.6	52.4	0.0
Tamil Nadu	11.3	8.2	2.4	10.5	100.0	22.0
Uttar Pradesh	14.9	9.6	7.6	9.9	59.0	16.2
West Bengal	6.1	5.3	3.7	5.6	50.0	0.0
ALL-INDIA	**10.8**	**8.5**	**8.0**	**10.1**	**48.1**	**11.2**

Table 15. Percentage Distribution of Non-hospitalised (OPD) Cases According to Place of Treatment, Distance and Place of Residence for Selected States

States	*Non-hospitalised Resorting to Public Facilities*				*Non-hospitalised Resorting to Private Facilities*			
	Rural	*Distance 10 Kms. +*	*Urban*	*Distance 6 Kms. +*	*Rural*	*Distance 10 Kms. +*	*Urban*	*Distance 6 Kms. +*
Andhra Pradesh	36.0	17.0	26.3	6.0	64.0	13.5	73.7	2.7
Assam	3.0	6.5	43.8	3.6	37.0	0.0	56.2	0.0
Bihar	36.0	2.0	25.6	8.6	64.1	3.4	74.4	2.1
Gujarat	41.0	8.0	32.1	5.1	59.0	26.5	67.9	3.6
Haryana	28.2	13.6	29.2	6.4	71.8	14.3	70.8	4.0
Himachal Pradesh	51.8	38.6	58.5	22.6	48.2	4.9	41.5	18.2
Karnataka	59.7	25.8	42.2	11.7	40.3	30.0	57.8	14.8
Kerala	27.0	20.8	37.2	20.5	73.0	16.9	62.8	9.8
Madhya Pradesh	27.6	33.8	30.4	16.0	72.4	20.3	69.6	9.1
Maharashtra	38.4	18.8	27.7	9.6	61.6	10.4	72.3	4.1
Orissa	70.7	3.2	34.3	2.4	29.3	10.3	65.7	3.8
Punjab	35.8	4.6	22.4	3.6	64.2	4.7	77.6	2.1
Rajasthan	56.7	6.7	48.1	3.4	43.2	9.7	51.9	2.3
Tamil Nadu	51.8	30.6	28.5	17.0	49.2	15.0	71.5	7.2
Uttar Pradesh	24.1	5.3	13.7	9.7	75.9	7.8	86.3	5.2
West Bengal	24.0	12.0	26.7	2.8	76.0	2.5	73.3	2.0
ALL-INDIA	**41.2**	**13.3**	**33.8**	**10.0**	**58.8**	**14.1**	**66.2**	**5.6**

Table 16. Type of Service Center Approached by Those Who Sought Treatment According to Place of Residence for Selected States

States	Rural				Urban		
	Public Hospital	*Public Dispensary*	*Pvt. Hospital*	*Pvt. Clinic*	*Public Hospital*	*Pvt. Hospital*	*Pvt. Clinic*
Andhra Pradesh	17.3	16.2	28.3	38.2	28.0	38.2	33.7
Assam	37.5	28.1	1.3	33.1	46.3	4.5	49.3
Bihar	14.7	22.2	8.8	54.2	28.3	14.7	56.9
Gujarat	15.7	24.7	12.4	47.2	31.4	21.4	47.2
Haryana	25.6	8.9	11.1	54.4	31.9	21.8	46.2
Himachal Pradesh	37.9	18.9	3.2	40.0	60.3	9.5	30.2
Karnataka	46.3	13.6	16.7	23.5	42.0	22.1	35.9
Kerala	10.0	11.7	23.9	46.3	38.5	18.3	43.1
Madhya Pradesh	14.4	15.4	4.4	65.8	31.8	6.6	61.5
Maharashtra	17.0	20.6	12.8	49.6	33.0	18.1	48.9
Orissa	33.8	38.0	5.6	22.5	36.3	11.3	52.3
Punjab	18.2	23.4	6.5	51.9	27.1	13.6	59.3
Rajasthan	25.5	32.4	10.0	31.7	49.9	14.8	35.4
Tamil Nadu	14.4	36.0	6.4	43.2	29.1	21.2	49.8
Uttar Pradesh	11.3	15.6	6.6	66.5	17.9	9.4	72.7
West Bengal	13.0	13.9	2.8	70.4	29.0	6.6	64.3
ALL-INDIA	**19.8**	**22.9**	**9.1**	**48.2**	**36.4**	**14.3**	**49.3**

Table 17. Medical Expenditures (Fee-Medicines only) on Non-hospitalised and Hospitalised Episodes by Type of Facility in Rural Areas for Selected States

State	*Rural*							
	Hospital			*Non-hospital*				
	Public	*Private*	*All*	*Public*	*Pub. Ext.*	*Private*	*Pri. Ext.*	*All*
Andhra Pradesh	358	688	616	64	36	267	109	120
Assam	216	0	216	38	15	112	70	45
Bihar	123	1573	713	44	33	210	81	73
Gujarat	605	618	614	79	23	178	108	94
Haryana	267	1174	507	31	0	275	70	67
Himachal Pradesh	213	0	213	50	14	206	78	62
Karnataka	136	1393	625	32	9	323	68	76
Kerala	420	1147	699	15	5	339	97	123
Madhya Pradesh	146	548	259	13	2	129	47	36
Maharashtra	246	520	436	25	10	297	58	49
Orissa	224	510	229	45	34	160	16	35
Punjab	138	350	148	74	3	229	58	46
Rajasthan	283	883	424	27	12	153	49	35
Tamil Nadu	0	933	796	28	0	75	34	23
Uttar Pradesh	490	1220	746	6	16	142	46	40
West Bengal	156	0	156	51	2	91	53	49
ALL	**291**	**962**	**554**	**34**	**16**	**241**	**59**	**56**

Table 18. Health Expenditures (Fee-Medicines only) on Non-Hospitalised and Hospitalised Episodes by Type of Facility in Urban for Selected States

State	*Rural*						
	Hospital			*Non-hospital*			
	Public	*Private*	*All*	*Public*	*Private*	*Pri. Ext.*	*All*
Andhra Pradesh	501	989	718	37	192	61	85
Assam	330	0	330	35	211	85	68
Bihar	210	670	369	33	265	114	109
Gujarat	304	1262	998	52	140	86	80
Haryana	303	1029	551	32	217	101	100
Himachal Pradesh	178	767	356	30	219	65	56
Karnataka	228	922	517	32	365	82	95
Kerala	162	1012	497	39	136	52	56
Madhya Pradesh	157	1309	449	14	115	56	45
Maharashtra	280	1016	591	32	208	116	99
Orissa	404	531	442	57	144	107	91
Punjab	134	440	234	37	140	70	70
Rajasthan	207	380	226	31	186	59	59
Tamil Nadu	49	1104	581	9	159	55	49
Uttar Pradesh	142	1209	576	48	190	68	71
West Bengal	292	1298	543	56	197	117	103
ALL	**261**	**1115**	**605**	**36**	**201**	**81**	**79**

Table 19. Household Expenditure on Curative Health Care

(Rupees)

Household Income Group	*Average Annual Household Income*	*Average Annual Household Health Expenditure*	*Expenditure as Percentage of Income*	*Per Capita Annual Expenditure*
		RURAL		
18,000	10946	855.84	7.82	167.81
18001-54000	29033	1195.44	4.12	206.36
54,001	76039	1722.33	2.27	246.10
TOTAL	**18716**	**988.40**	**5.28**	**183.87**
		URBAN		
18,000	12832	908.18	7.08	194.58
18001-54000	32147	1352.33	4.21	262.66
54,001	78504	2313.20	2.95	406.81
TOTAL	**430184**	**1294.09**	**4.29**	**257.64**
		TOTAL		
18,000	11303	865.75	7.66	172.53
18001-54000	30233	1255.93	4.15	226.51
54,001	77431	2055.84	2.66	328.53
TOTAL	**21931**	**1074.10**	**4.90**	**203.56**

Note : Estimates are based on the expenditure incurred by the households during the one month reference period for the treatment of illnesses.

Table 20. Relative Risks of Morbidity for Various Age Groups and Socio-economic Characteristics

	Sample Population	*0-4 yrs*	*5-14 yrs*	*15-34 yrs*	*35-59 yrs*	*60 + yrs*
No. of observations	99605	7240	21593	38516	26913	5343
Chi sq	2347.08	257.23	400.31	751.74	475.62	199.86
Mean of Dep Var Sick=1	0.103	0.135	0.078	0.084	0.125	0.195
Sex: Male=1	0.95**	1.19**	1.10*	0.89***	0.84***	1.08
Age: 0-4 yrs	1.00	reference category				
5-14 yrs	0.55***	-	-	-	-	-
15-34 yrs	0.57***	-	-	-	-	-
35-59 yrs	0.88***	-	-	-	-	-
60 & above yrs	1.65***	-	-	-	-	-
Head's Education:						
Primary Education	1.00	reference category				
Secondary Education	0.97	1.51***	0.83***	1.03	0.87***	1.00
Above Secondary Edu.	0.97	1.82***	1.20**	0.88**	0.89**	0.89
Religion: Hindu=1	1.01	0.70***	1.22***	0.93	1.20***	0.89
Caste:SCs/STs=1	0.95**	1.25***	0.79***	1.03	0.88**	0.83*
Residence: Urban=1	1.00	1.02	0.95	0.99	1.04	1.04
Household Income:						
Upto Rs. 18000	1.00	reference category				
Rs.18001-36000	0.92***	0.79***	0.83***	0.90	0.92	1.20**
Rs.36001-56000	0.90**	0.70**	0.91	0.88*	0.83 **	1.44***
Rs.56001-78000	0.87**	0.54***	0.87	0.83	0.82	1.54
Above Rs.78000	0.86**	0.47**	0.81	0.76*	0.96	1.34
Household Size:						
Upto 4 members	1.00	reference category				
5 - 7 members	0.67***	0.57***	0.68***	0.62***	0.75***	0.61***
8 and above	0.47***	0.44***	0.37***	0.36***	0.67***	0.47***
States:						
Andhra Pradesh	0.68***	0.38***	0.25***	0.98	0.80**	0.89
Assam	0.46***	0.16***	0.43***	0.60***	0.41***	0.58**
Bihar	0.56***	0.38***	0.42***	0.81**	0.52***	0.39***
Gujarat	0.37***	0.46***	0.22***	0.43***	0.38***	0.30***
Haryana	0.42***	0.51**	0.32***	0.48***	0.41***	0.35***
Himachal Pradesh	0.86	0.46*	0.38**	1.11	1.09	0.88
Karnataka	0.57***	0.20***	0.33***	0.88	0.58***	0.57***
Kerala	1.00	reference category				
Madhya Pradesh	0.67***	0.50***	0.53***	1.17	0.51***	0.47***
Maharashtra	0.36***	0.46***	0.24***	0.45***	0.31***	0.32***
Orissa	1.05	1.12	0.89	1.36***	0.82*	1.17
Punjab	0.67***	0.20***	0.77	0.94	0.65***	0.71
Rajasthan	0.70***	0.69	0.44***	1.10	0.65***	0.52***
Tamil Nadu	0.38***	0.46***	0.37***	0.34***	0.34***	0.39***
Uttar Pradesh	0.58***	0.47***	0.41***	0.76***	0.56***	0.62***
West Bengal	0.41***	0.80	0.34***	0.54***	0.28***	0.32***

*** = $P<001$; ** = $P<05$; * = $P<10$.

Table 21. Relative Risks of Morbidity According to Place of Residence, Sex and Socio-economic Determinants

	Rural	*Urban*	*Female*	*Male*
No. of observations	36792	62813	46022	53583
Chi square	854.81	1718.63	1288.70	1154.05
Mean of Dep Var Sick=1	0.104	0.101	0.105	0.101
Sex: Male=1	0.97	0.90***	-	-
Age Groups				
0-4 yrs	1.00 ---------- reference category ----------			
5-14 yrs	0.57***	0.49***	0.57***	0.53***
15-34 yrs	0.58***	0.52***	0.64***	0.50***
35-59 yrs	0.88*	0.83***	0.76***	
60 & above yrs	1.62***	1.68***	1.69***	1.58***
Head's Education				
Primary Education	1.00---------- reference category ----------			
Secondary Education	0.94	0.96	1.00	0.93*
Above Secondary	1.03	0.88***	0.96	0.97
Religion: Hindu=1	1.02	1.00	0.97	1.04
Caste : SC/ST=1	0.94	1.00	0.91**	0.97
Urban Residence =1	-	-	1.01	0.98
Household Income				
Upto Rs. 18000	1.00 ---------- reference category ----------			
Rs. 18001-36000	0.92*	0.93**	0.96	0.88***
Rs. 36001-56000	0.88*	0.93*	0.93	0.86***
Rs. 56001-78000	0.87	0.89**	0.91	0.83**
Above Rs. 78000	0.89	0.85**	0.89	0.83*
Household Size				
Upto 4 members	1.00 ---------- reference category ----------			
5-7 members	0.67***	0.65***	0.60***	0.72***
8 and above	0.46***	0.49***	0.38***	0.54***
States				
Andhra Pradesh	0.65**	0.74***	0.68***	0.67***
Assam	0.46**	0.36***	0.46***	0.44***
Bihar	0.54**	0.61***	0.59***	0.52***
Gujarat	0.34**	0.43***	0.41***	0.33***
Haryana	0.40*	0.50***	0.45***	0.39***
Himachal Pradesh	0.83	1.04***	1.07	0.67**
Karnataka	0.60*	0.51***	0.60***	0.55***
Kerala	1.00 ---------- reference category ----------			
Madhya Pradesh	0.65*	0.72***	0.75***	0.59***
Maharashtra	0.33*	0.41***	0.38***	0.33***
Orissa	1.04	1.05	1.37***	0.81**
Punjab	0.63*	0.77***	0.67***	0.66***
Rajasthan	0.63*	0.97	0.83*	0.60***
Tamil Nadu	0.38*	0.37***	0.40***	0.35***
Uttar Pradesh	0.60*	0.46***	0.60***	0.54***
West Bengal	0.41*	0.40***	0.46***	0.35***

****P < 0.001; **P < 0.05; *P < 0.10.*

Table 22. Relative Risks of Morbidity for Various Regions and Socio-economic Characteristics

	Sample Population	*South*	*West*	*Upper Central*	*Lower Central*	*North*	*East*
Observations	99605	24569	14640	25284	20581	5976	8555
Chi sq	2347.08	776.65	292.15	598.81	399.53	165.23	109.48
Dep Var Sick=1	0.103	0.114	0.073	0.100	0.127	0.080	0.113
Sex: Male=1	0.95**	1.01	0.93	1.01	0.85***	0.96	0.91
Age :							
0-4 yrs	1.00	---------- reference category ----------					
5-14 yrs	0.55***	0.59***	0.35***	0.60***	0.59***	1.02	0.39***
15-34 yrs	0.57***	0.61***	0.35***	0.64***	0.65***	0.88	0.36***
35-59 yrs	0.88***	1.12	0.58***	1.01	0.83***	1.43**	0.45***
60 yrs +	1.65***	2.12***	1.00	2.08***	1.34***	2.83***	0.99
Head's Education							
Primary Edu	1.00	---------- reference category ----------					
Secondary Edu.	0.97	0.92*	1.23***	0.86***	1.03	1.13	0.85
Above Secondary	0.97	0.82***	1.31***	0.98	1.03	1.20	0.86
Religion : Hindu=1	1.01	0.92	1.10	0.99	1.26**	1.05	1.07
Caste : SCs/STs=1	0.95**	1.15**	1.00	0.89**	0.86***	1.00	0.90
Urban = 1	1.00	0.99	1.16**	0.84***	1.07	1.11	1.00
Household Income							
Upto Rs. 18000	1.00	---------- reference category ----------					
Rs.18001-36000	0.92***	0.97	0.77***	0.91*	1.02	0.86	0.84
Rs.36001-56000	0.90***	0.87*	0.82*	0.74***	1.07	1.00	1.09
Rs.56001-78000	0.87**	0.81*	0.69**	0.89	0.97	1.16	0.80
Above Rs.78000	0.86**	0.98	0.64**	0.77*	1.03	0.82	0.92
Household Size							
Upto 4 members	1.00	---------- reference category ----------					
5 - 7 members	0.67***	0.78***	0.69***	0.50***	0.66***	0.71**	0.86
8 + members	0.47***	0.56***	0.36***	0.39***	0.46***	0.42**	0.59
States							
Andhra Pradesh	0.68***	0.68***	-	-	-	-	-
Assam	0.46***	-	-	-	-	-	1.12
Bihar	0.56***	-	-	0.94	-	-	-
Gujarat	0.37***	-	1.01	-	-	-	-
Haryana	0.42***	-	-	-	-	0.56***	-
Himachal Pradesh	0.86	-	-	-	-	1.16	-
Karnataka	0.58	0.55***	-	-	-	-	-
Kerala	1.00(REF)	1.00(REF)	-	-	-	-	-
Madhya Pradesh	0.67***	-	-	-	1.00(REF)	-	-
Maharashtra	0.36***	-	1.00(REF)	-	-	-	-
Orissa	1.05	-	-	-	1.53***	-	-
Punjab	0.67***	-	-	-	-	1.00(REF)	-
Rajasthan	0.70***	-	-	-	1.01	-	-
Tamil Nadu	0.38***	0.37 ***	-	-	-	-	-
Uttar Pradesh	0.58***	-	-	1.00(REF)	-	-	-
West Bengal	0.41***	-	-	-	-	-	1.00(REF)

**** = P<001; ** = P<05; * = P<10 : REF= reference category.*

Table 23. Odds Ratios Relating to the Determinants of Hospitalisation and Type of Facility

	Hospitalisation		*Public/Private Facility*	
	Rural	*Urban*	*Rural*	*Urban*
No. of observations	*3607*	*6087*	*3607*	*6087*
Mean of Dep Var Hosp=1				
Sex : Male=1	1.38**	1.57***	0.95	1.15***
Age Groups 0-4 yrs	1.00	reference category		
5-14 yrs	1.12	1.49	1.07	0.97
15-34 yrs	1.13	1.55*	1.06	1.03
35-59 yrs	2.04**	1.97***	1.09	1.11
60 & above yrs	2.67**	2.51***	1.03	1.10
Head's Edu. : Primary	1.00	reference category		
Secondary	1.35*	1.23*	0.88	0.91
Above Secondary	1.90***	1.23	1.15	0.64***
Religion : Hindu=1	1.24	1.01	1.11	1.22***
Caste : SC/ST=1	0.70*	0.79*	0.86*	0.22***
Income : Upto Rs. 18000	1.00	reference category		
Rs. 18001-36000	1.19	0.93	0.90	0.68***
Rs. 36001-56000	1.08	1.13	0.77*	0.56***
Rs. 56001-78000	1.21	1.15	0.63*	0.51***
Above Rs. 78000	1.56	1.29	0.40***	0.40***
Household Size : 1-4 mem	1.00	reference category		
5-7 members	1.14	1.24**	0.96	0.89*
8 and above	0.95	1.36**	0.95	1.10
Nature :				
Infectious	3.07***	1.90***	1.21***	1.12
Non-infectious	2.85***	4.30***	1.09	1.16**
Fevers & others	1.00	reference category		
Public Facility =1	2.68***	3.40***	--	--
Distance : Upto 3 kms.	1.00	reference category		
4-5 kms.	2.91***	3.02***	1.63**	2.08***
6-10 kms.	10.39***	3.96***	1.84**	2.03***
Above 10 kms.	19.60***	3.80***	2.29**	2.50***
States : Andhra Pradesh	1.35	4.45***	0.96	0.79*
Assam	0.55	0.28	3.55*	2.18***
Bihar	1.98*	2.66***	1.19	0.67***
Gujarat	0.71	3.12***	0.93	0.85
Haryana	1.73	3.61***	1.54	1.22
Himachal Pradesh	0.30*	1.50	2.35**	2.35*
Karnataka	0.22***	2.71***	1.76**	1.10
Kerala	1.00	reference category		
Madhya Pradesh	0.31*	0.78	0.91	0.80
Maharashtra	0.73	5.50***	1.17	0.92
Orissa	0.54	1.37	3.53***	1.34
Punjab	2.82**	4.35***	2.18***	0.58***
Rajasthan	1.11	1.44	3.36*	1.87***
Tamil Nadu	0.10***	2.01**	1.47	0.72**
Uttar Pradesh	1.12	3.48***	0.86	0.44***
West Bengal	0.11***	1.03	0.53***	0.85

****P < 0.001; **P < 0.05; *P < 0.10.*

APPENDIX I

A Note on Sampling Design

In the present survey a three-stage stratified sample design with varying probabilities in the first stage has been adopted with districts/towns, villages/urban blocks and households as sampling units in subsequent stages. All states and union territories of India have been covered except Arunachal Pradesh, Manipur, Mizoram, Nagaland, Sikkim, Jammu and Kashmir, Andaman and Nicobar Islands, Dadra and Nagar Haveli and Lakshadweep.

For rural sample, 410 districts in the states/union territories have been covered in the survey. Each of these districts has been selected with probability proportional to the population of the villages in 1981. In all 718 villages were selected. All households in the selected villages were listed through a specially designed proforma. Households listed in the sample villages have been stratified into the five income groups which makes it possible to give these groups adequate representation. Sample households within each stratum have been selected with equal probability using random number tables. Selections have been done independently for each stratum.

In case of urban areas the cities/towns with population exceeding 500,000 have been included in the sample with probability 1. The remaining two cities have been grouped into six strata on the basis of their population size and from each stratum a sample of towns has been selected independently. A progressively increasing sampling fraction with increasing town population class has used for determining the number of sample towns to be selected from each stratum. The sampling fractions have been used at the state level. The number of blocks selected vary between 2 and 30, depending upon the size of the town. The total number of blocks thus selected are 1509. As in the case of villages, all households in the selected urban blocks have been listed, *stratified by income categories and then selected.* The process of household stratification and selection remained same as that for rural sample.

The first question which a statistician is, invariably, called upon to answer in planning a sample survey is about the size of the sample required for estimating the population value with a specified level of precision. The level of precision is usually specified in terms of the margin of error permissible in the estimate. The required sample size (n) for estimating the given population proportion (p) with a specified permissible error in the estimate (E) is given by

$$n = \frac{1 - p}{E^2 * p}$$, when the population is very large.

By applying this formula, the required sample sizes for different values of p and two levels of margin of error, i.e., 5% and 10%, are given in the following statement.

Number of Persons (Required Sample Size=n) for Different Proportions of Sick Persons (p)

Proportion of Sick Person	*Sample Size Margin of Errors*	
	E = 5%	*E = 10%*
0.05	7600	1900
0.06	6267	1567
0.07	5314	1329
0.08	4600	1150
0.09	4044	1011
0.1	3600	900
0.11	3236	809
0.12	2933	733
0.13	2677	669
0.14	2457	614
0.15	2267	567
0.16	2100	525
0.17	1953	488
0.18	1822	456
0.19	1705	426
0.2	1600	400

These sample sizes are sufficient to estimate the proportion only at the state level. However, since in the present survey the ultimate sampling units are households which are likely to have both males and females. It could be possible to attempt to get state level estimate by sex as well.

It should be cautioned that while the above formula is relevant only in the case of simple random sampling, in the present survey stratified cluster sampling has been employed.Therefore, in reality it requires a larger sample size due to the design effects, etc. If estimate is needed within state by different subgroups then each subgroup needs same sample size for state as a whole. For example, if one would like to get estimates by considering three subgroups within state like occupation, etc., the sample size needed would be 3 times n.

In light of this for states like U.P., Bihar, M.P. and to some extent for Maharashtra and Rajasthan one may attempt maximum of three classifications at 10% margin of error if the expected p value around 10%.

It may be noted that with 10% margin of error the confidence interval would be p + 0.20p. Thus if two subgroups show observed values of p are 8.0 & 11.5, then the confidence interval worked for these two estimates would be such that the difference between two proportions would turn out to be statistically not significant.

However, it is possible to get sub-group estimates at the zonal level. The following table represents the number of possible one-way classifications within a zone assuming a population proportion of 10%. For example, in the rural area, the number of possible one-way classification for analysis is given below for each of the four zones.

Zonal Level Classification

Zones	*Number of Persons in the Sample*	*Number of Possible One-way Classification Within Zone*	
		E = 5%	*E = 10%*
1. North	14837	4	16
2. South	6663	2	7
3. East	9337	3	10
4. West	6956	2	8

It may be noted that, depending upon the size of the sample size available for different zones, one can have 2-4 one-way classifications within a zone with a 5% margin of error, while there may be 7-16 classifications when the margin of error is 10%. Alternatively, one can have nested classification, for example: instead of having 16 classifications in north zone at 10% margin of error, one could have 4 age groups and within each age group 4 occupational classes provided each cell has adequate sample size.

Notes

1. An earlier version of this paper was presented in workshop on 'Morbidity Measurement and Health Research' held at Sri Achutha Menon Centre for Health Science Studies, Thiruvananthapuram, January 11-13, 1995 organised by the UNDP Research Project on 'Strategies and Financing for Human Development'. I wish to thank S.L. Rao, Prem Vashishtha, S.P. Pal, Sushil Kabra, Anil Deolalikar, Anil Gumber, R.K. Shukla and A. Vaidhyanathan for comments; and Chhabi Sinha, Surajit Baruah and K.N. Kool for help in data management and analysis.

2. This survey was conducted in all States and Union Territories except Arunachal Pradesh, Manipur, Mizoram, Nagaland, Sikkim, Jammu and Kashmir, Andaman and Nicobar Islands, Dadra and Nagar Haveli and Lakshadweep. However, data pertaining to sixteen major states only are discussed in this paper.

3. No effort has been made in this analysis to compute the annual morbidity prevalence or incidence rates. It is, however, cautioned that a common practice of computing annual morbidity rate based on 15 days or 30 days recall period by multiplying a factor of 24 or 12 respectively will present a misleading picture. Indeed there is a need to develop methodologies to compute prevalence rates taking into account the nature and duration of sickness and disability. Persons reporting to have been suffering from long duration sicknesses during the reference period of previous 30 days will be counted 11 additional times in the computation of prevalence or incidence if multiplied by a factor of 12 to compute the annual rates.

4. In this survey information on public hygiene, sanitation, quality of drinking water and health infrastructure was not collected. Efforts are being made to collect data on these variables in the forthcoming surveys.

5. Three variables highlighting education levels were considered for this analysis. They are (a) the education level of the head of the household, (b) the education level of the adult female members in the household, and (c) education level of the sick person. The last indicator was not considered as children less than seven years would not record any level of education but could be having high incidence of morbidity. Secondly a study of the partial correlation coefficients suggested that the level of education of the adult female member had a weak and insignificant correlation with household head. Thus the logit specification has been conceived by considering the importance of the level of education of the household head as an exogenous household level variable.

Part II
Health Scenario and Public Policy in India

Part II is a Critic of the Public Health Policy in India

This paper was presented at a session on
'Can Health Transition Research Drive Health Improvement'
in a seminar on The Continuing Demographic Transition
organised in honour of Professor J.C. Coldwell,
held at the Australian National University,
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1. Provision of Health Care to People : A National Objective

Health and education have always been viewed as the public goods to be made available on a mass scale by the governments free or at reasonable costs to the masses. Both of these are the basic human (resource) development inputs along with nutrition. Unlike nutrition, which has been traditionally produced and consumed by the individuals themselves, health and education in the contemporary period needs to be brought in from outside the local structures. Modern health technology based on the allopathic system became more acceptable largely due to its capacity to produce direct and often immediate effects on human health. A mass promotion and supply of the allopathic health technology was indeed possible because of a strong and stable organisation which in the Indian case was the state. The popular policies based on provision and extension of health and education are also the political goals of politicians and the governments since the Independence. Thus education and health have been identified as public goods in the modern day economic terminologies.

It is appropriate to recall the guiding principles suggested by the Bhore Committee as early as in 1946 in regard to the provision of health care to the citizens of India :

(a) That no individual should fail to secure adequate medical care because of inability to pay for it.

(b) The health programme, must, from the very beginning, lay special emphasis on preventive work with consequential development of environmental hygiene.

(c) The health services should be placed as close to the people as possible in order to ensure the maximum benefit to the 'communities to be served'.

(d) The Doctor — the leader of the health team should be a 'Social Physician', who should combine remedial and preventive measure as to confer the maximum benefit on the community, and the future doctors should be trained to equip them for all such duties.

One would find the echoes of these four principles emphasised by the Bhore Committee even in the Alma Ata Declaration of 1977 and the more recent efforts of the UNICEF to communicate the meaning of 'economic

reforms with a human face'. At least in India the previous about 50 years of organised efforts have failed to achieve the above mentioned targets and quality in the provision of health care.

2. Appropriate Health Care

India is known for the multiplicity of the treatment regimes often ranging from well documented and researched allopathic system to traditional healing and home remedies. However, the advantage of standardization, packing, storage and different methods of dispensation has made the allopathic health care package more acceptable. The 'miracle of injection' a method of drug dispensation has become popular even in the remotest villages, and many quacks profess a command over it as well. In fact the instrument meant for injecting medicine in the human body has become a symbol of health more symbolic than a stethoscope.

Historically, persons having knowledge of indigenous medicine have always been accorded prime of the place in the social hierarchy. However, the clearly identifiable indigenous systems of medicines fall in the regime of so called the 'great tradition'. Thus Ayurveda, Siddha and Unani types of medicines fall in to the realm of great traditions often intermingled with the religious and supra-cultural values. These medications in the past appear to have been accessible only to the ruling elite, and the landlords of yesteryears. A large proportion of commoners were left out to find and evolve their own treatment regimes. Thus a number of traditional medicinal regimes are found among innumerable local cultures and among the tribal groups who have been knowledgeable and living proximately with the flora and fauna of the micro-regions. Such medications fall in the realm of 'little traditions' on the lines of the Indian religious and cultural identities which are so differentiated.

Much of this type of medication is indeed preventive in nature. Various types of food items and local dietetic practices are the first step both in prevention and cure, followed by the application of topical as well as oral medications extracted from herbs, barks of selected types of trees, flowers, seeds, roots, and animal products. The local familiarity with both domesticated and wild animals have played a special role in the evolution of medication. So also is the aseptic characteristics of human urine. The animal behaviours during pregnancies, deliveries, and the natural self-healing reflexes of animals for injuries appear to have played immense role in devising the local treatment regimes. Astrology and numerology as the

methods of predicting future health is probably a lot to gain from the knowledge of the association of the path of sun and moon, and their role in determining local climates. Similarly long term observations relating to the source of drinking water did enable even the tribals living in remotest possible places to recognise the hidden strength of earth in providing not only the taste (softness) in water but also medicinal value both through potability and through its use in topical applications such as during bathing. Indeed the topical application of water mixed with juices of various types of leaves, twigs and fruits is even now practices as one of the dominant way of medication.

Culturally, specific type of fruits, vegetables, nuts, leaves, roots, barks and animals are even today consumed at different periods often related to different rituals and festivals. These practices have been evolved through centuries keeping both the so called 'humoral' (tridosha) nature of foods and a balance or protection of plant and animal species in mind.

Such treatment regimes, however, were also intermingled with the norms of the so called 'little traditions' often governed by mysticism, magic and superstition. Magic, mysticism and sorcery, however, seems to be the means for keeping clear distinction between those who knew the healing knowledge and those who sought such treatments.

3. Role of Prevention in Maintaining Health

The access to quality health care available for masses at a particular time in the past has always been a problem. A problem which persists even today in a country like India. It is therefore all the more imperative to emphasise the importance of prevention. Role of prevention in maintaining health is probably the most misunderstood aspect in heath care schemes in India, both at the individual/household and at the programme and policy levels. At the individual/household level it relates to the conceptualization of the origin of disease, mechanisms of disease transmission, gestation and asymptomatic period, physical manifestations and so on.

At the programme/policy level the emphasis seems to have always been on curative medicine. Mother and child immunization services provided through the so called preventive programmes are essentially the gift of technology rather than a commitment or a philosophy of medication. Expanding the medical supply approach to include establishing and maintaining the health producing (disease inhibiting) infrastructure and services is essential. Maintenance of personal and environmental sanitation

and hygiene, educating the ways and means of harvesting, storing and consuming potable water, management of solid waste as well as that of human excreta is most essential to achieve good health for the masses.

4. Health Care Supply : Institutions, Infrastructure and Extension Approach

Since the Independence there have been commendable efforts to create infrastructure and institutions so as to extend the health care services to the masses. Besides having a number of urban based hospitals, there has been a network of primary health care infrastructure created in the rural areas. However, because of the sheer size and growth of India's population it has become almost impossible for the governments to expand the infrastructure and increase the availability of services. Over a period of time even the range of services to be provided through various programmes has also increased.

In spite of concerted efforts the health infrastructure and supplies are inadequate and not accessible to people. Besides there is a misplaced emphasis as far as the current policy focus is on creating physical infrastructure and upgrading institutions through cosmetic changes. Indeed the most essential child survival programme is only recently extended to about 300 out of 550 districts/blocks all over the country. Even in this programme the safe motherhood programme is implemented only in about half of these selected districts. The 'integrated child development services' programme which aims at comprehensive development of children during the pre-school period have not created the desired effects.

(a) Epidemiological and Target Approach to Improvement of Health

A large number of specific and clearly identifiable diseases require purely medical and epidemiological approach for its eradication. The onset of many diseases are predictable which are known to have a local and time specific characteristics. For example, malaria, cholera and smallpox falls into this category. A few other disease, such as tuberculosis, leprosy, goiter, elephantiasis and so on also have a regional dimension. Thus an epidemiological and target approach is essential for reducing the deaths caused of diseases which have endemic and epidemic characteristics.

5. Popular Demand for Health Care: Is There a Choice?

The mortality and life expectancy of Indian population has substantially improved. The expectation of life at birth which was only about 23

years during 1901-11 improved to 32 years during 1941-51 and reach as high as 58 years during 1986-90. The death rate which was as high as 27 per thousand population before independence has fallen to about 9 per thousand by 1990. The Infant Mortality Rate which was 243 per thousand births has fallen to about 80 by the 1990s. Many types of mortalities have also declined some because of the externality effects of immunizations and many others by the possibility of getting treatment before the disease turns out to be fatal. Thus there has been a substantial health transition gain during the last five decades. It is important to investigate the reasons which have helped to bring about these gains in health transition. Can one attribute this to policy? Or to the availability of curative allopathic medicine? Both these, however, are the necessary but, are they sufficient conditions for health transition?

(a) Efficacy: People Should Have a Choice

The health services should be placed as close to the people as possible in order to ensure the maximum benefit to the communities to be served. It is here that one should precisely define what is health care and how could that be placed close to the people? Closeness and choice in health services may have the following dimensions:

(i) Proximity and Physical Accessibility : Since over two-thirds of India's population still lives in the rural outback, extending and facilitating the health care services is a herculean task. This is so because the health care technology is expected to originate in the far-off urban areas which needs to be made available to people living in innumerable villages and hamlets. However, what India and for that matter many other developing countries are unable to do is articulate and define health care in a local and cultural perspective. But for a few essential preventive and curative services most of the health care requirements can be dealt within the village context. Making people depend less on the so called modern medicine and reorienting them in the attributes of traditional medicine and self-medication indeed increases the accessibility to health care.

One good example can be found in the current situation with respect to the place of birth and attention at child birth. A large number of births still take place within in home and in the absence of trained medical attendants. Thus proper health care services are not available to women especially during child birth. In fact what is needed is a strategy to disseminate simple tips useful in undertaking aseptic delivery and providing simple and inexpensive aseptic delivery kits on a mass scale. This strategy alone will

improve the proximity to health care beside reducing people's dependence on organised health care infrastructure.

(ii) Familiarity and Acceptability of the Services : Familiarity and acceptability are essentially the extension of the concept of proximity. However, one clear distinction is that the national health programme should integrate and amalgamate the new health concepts largely originating from the allopathic system of medicine with the local concepts and practices. Thus far public policy has been reticent even to recognize the need to undertake such efforts. As mentioned elsewhere, the traditional concepts are full of preventive undertones which can be suitably adapted and integrated into the preventive and promoted modern health care in India.

(iii) Qualified Individual Choice Based on the Capacity to Spend : On the whole there has to have facilities to people for 'qualified individual choices' with respect to health care. What this really means is that the Indian health care programme should build up a multi-type health care system. A number of acute and simpler ailments can indeed be managed and cured by using the traditional and indigenous concepts. Such concepts should be popularised through the public programmes. The high technology and specialty services should be reserved for essential and life saving situations. Besides, there has to be scope for a health care system in which the public, private and voluntary sectors should coexist, not only by competing with each other in supplying quality health care but also complementing each other through a well conceived referral system. It is well known that about two-thirds of the Indian health care sector is private and that too functioning on proprietary basis. Almost one-half of the institutional treatments, both in the rural and urban areas of India, are being provided by the private clinics (Table 1, columns 4 and 7) often run by untrained or under-trained individual practitioners (Bhatia, 1993).

Such a choice based approach, over a period of time influence the balance between the preventive and curative approaches of health care. Such choices along with provision of mass education and information will indeed reduce the morbidity load to begin with through an increase in overall efficiency of the public investments through increasing the efficacy of preventive health care.

(b) Choice Based Reproduction and Provision of Reproductive Health Services

Reproductive health is the most neglected and misconceived health aspect in India. India being the first country in the world to have launched

Table 1. Source of Treatment for Those Who Sought Treatment

	Rural				*Urban*		
	Public Hospi-tal	*Public Dispen-sary*	*Pvt. Hospi-tal*	*Pvt. cli-nic*	*Public hospi-tal*	*Pvt. Hospi-tal*	*Pvt. Cli-nic*
	(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*
Andhra Pradesh	17.3	16.2	28.3	38.2	28.0	38.2	33.7
Assam	37.5	28.1	1.3	33.1	46.3	4.5	49.3
Bihar	14.7	22.2	8.8	54.2	28.3	14.7	56.9
Gujarat	15.7	24.7	12.4	47.2	31.4	21.4	47.2
Haryana	25.6	8.9	11.1	54.4	31.9	21.8	46.2
Himachal Pradesh	37.9	18.9	3.2	40.0	60.3	9.5	30.2
Karnataka	46.3	13.6	16.7	23.5	42.0	22.1	35.9
Kerala	10.0	11.7	23.9	46.3	38.5	18.3	43.1
Madhya Pradesh	14.4	15.4	4.4	65.8	31.8	6.6	61.5
Maharashtra	17.0	20.6	12.8	49.6	33.0	18.1	48.9
Orissa	33.8	38.0	5.6	22.5	36.3	11.3	52.3
Punjab	18.2	23.4	6.5	51.9	27.1	13.6	59.3
Rajasthan	25.5	32.4	10.0	31.7	49.9	14.8	35.4
Tamil Nadu	14.4	36.0	6.4	43.2	29.1	21.2	49.8
Uttar Pradesh	11.3	15.6	6.6	66.5	17.9	9.4	72.7
West Bengal	13.0	13.9	2.8	70.4	29.0	6.6	64.3
ALL-INDIA	**19.8**	**22.9**	**9.1**	**48.2**	**36.4**	**14.3**	**49.3**

Note : Includes both out-patient (clinic based) and in-patient (hospitalised) treatments.
Source: Shariff (1995:57).

an official family planning programmme it went ahead with an impressive population reducing programme. But the Indian family planning programme did indeed undermined the importance of reproductive health. The so called 'maternal and child health' (MCH) package propagated along with the family planning programme was expected to address the reproductive health matters. But this did not happen, mostly because the MCH was used as a precursor to contraception and on the whole people were lukewarm in utilising services. Besides, the MCH package which included maternal immunization, iron and vitamin prophylaxes, delivery services and child immunizations were too complicated to be dispensed at the doorsteps. The physical infrastructure and type of health personnel created were incapable in timely dispensation of quality MCH services. Other factors for its failure are the breakdown of the cold chain for storing and transporting medicines and immunizations, and too much dependence on the grassroots level workers who are devoid of supervisory and technical supports. Reproductive health issues deserve exclusive attention in India as they are closely linked with empowerment of women and intra-household decision making. One essential requirement, however, to improve the access to reproductive health is to induct female medical practitioners at the service centres on the one hand and female health guides at the village level on the other.

(c) People's Perceptions and Practices with Respect to Health Care?

In India there is a wide variation in the conceptualization of disease and sickness and the treatments to be sought. These variations are not due to the existence and knowledge of multiple choice but due to the lack of it. The basic premise, however, is that the diseases are inevitable and there to stay. Many common types of sickness are not taken seriously such as diarrhoea among children and white discharge among women. Such attitudes are governed by the experience of self limited sickness and associated behaviours. There are beliefs that certain types of diseases one must experience and the earlier the better? There are rituals and traditional practices which invoke the onset of measles among the young children. This practice is very common across all the parts of India.

Although in reality people suffer from a combination of sickness, diseases are conceptualized mostly as a single problem. Origin of disease are often attributed to nature, wrath of god and so on. Germs and parasites as the cause of sickness and diseases is only recently begun to be understood by the masses, although there is a long way to go before people choose prevention and cure based on this association.

Harvesting, fetching and storing water for drinking and domestic use, food preparation and storage habits are regulated by traditions often at odds with the modern scientific temper. Faeces and excreta as the source of infection and disease is almost not existent: Parasites and worms (both in and outside the human body) as the cause of ill health is not very well understood. Practice of humans and animals living together is one of the dominant source of infection in India. Protection of legs and limbs from infection emerging out of hazardous work conditions are never followed.

(d) Treatment Seeking Behaviour: A Case Study

The following observations from a village near Varanasi in eastern Uttar Pradesh will help in understanding comments made above. Recently, I was going aground a village for inviting selected women to participate in a focus group discussion on village health matters. Many in this village mistook me and other co-workers as the medical doctors. However, quite a few persons approached us to enquire, clarify and seek help in treating various health problems faced by them. One middle aged lady approached us and informed that one of her daughters aged about 9 years and her mother-in-law aged over sixty years have been bitten by a dog. We were inquisitive to find out what treatment have been sought and how are the patients coping with the dog bites.

The young girl had the dog bite mark right on the center of her forehead. It was a cut wound with blood marks on it. There was no sign of medication or bandage. The girl was looking dull but not sick. The dullness was likely to be due to severe heat conditions which were about 45 degree centigrade on that day. The old lady was bitten by the dog on her left palm. The cut was reported to be deep and the wound was wrapped with a bandage.

On further probes it was found out that the biting episode occurred two days before we met them. The dog was identified to be insane which seems to have bitten some more persons. The dog was chased and killed by the villagers. One of our team members confirmed that she did saw a dead dog two days ago. Thus it is clear that people were suspicious that the dog was insane and this should have made the concerned households and individuals seek proper treatment. In case of the two identified victims the following was done as treatment. The old lady who had deep cuts on her palm was taken to a neighbourhood doctor who dressed the wound with some topical application and the young girl was given some ointment to be applied with. Both these victims were however, taken to a nearby pond and made to see

their own shadow. Apparently, this is a test given to the victims of dog bites to confirm whether they are affected. If victims are affected they are expected to behave strangely and also feel afraid of water. It is believed that an insane dog is most likely to get drowned because of his fear with water and often it is not able to see water, so accidentally falls in water and gets drowned. In this area there are experts who compete with each other in diagnosis and treatment of dog bites. It seems that these so called dog bite experts know the secrets of nine different wells. The dog bite victims are taken around each of these selected wells to make them watch their own shadow, if victims succeed and do not behave strangely then they are declared safe otherwise are given local medicine. The competition between the practitioners is with respect of their independent claims that they know the best combination of nine wells.

The government policy in India is to provide anti-rabbis and anti-venom (for snake bites) injections free of cost to people through public dispensaries, primary health centers and hospitals. Previously the victims of the dog bites were to receive 24 injections which was brought down to about a dozen recently. Now there appears to be new drug which is injected only once. However, the market cost of these injections are very high. The one injection drug is reported to cost Rs. 450 (about US$ 14) in the market. On further probes with the family members of the victims it was discovered they vaguely knew the government hospital in Varanasi which may dispense free medicine for dog bites. But they never made an attempt to try out with the hospital. The villagers are resigned to the fact that it is a hassal and often unsuccessful to approach government hospitals for free or subsidised treatment. On the other hand they were not in a position to spend the high cost of drug and accompanying expenditures for the proper treatment from private sources as well. The masses thus are truly between the 'devil and deep see' with respect to accessibility to public and private health care services in India. Whether the family members would have been a bit more concerned if the victim were to be a boy instead of the girl? I am of the opinion that the treatment seeking behaviour would have been very different if the victim were to be a boy!

6. Health Transition Research

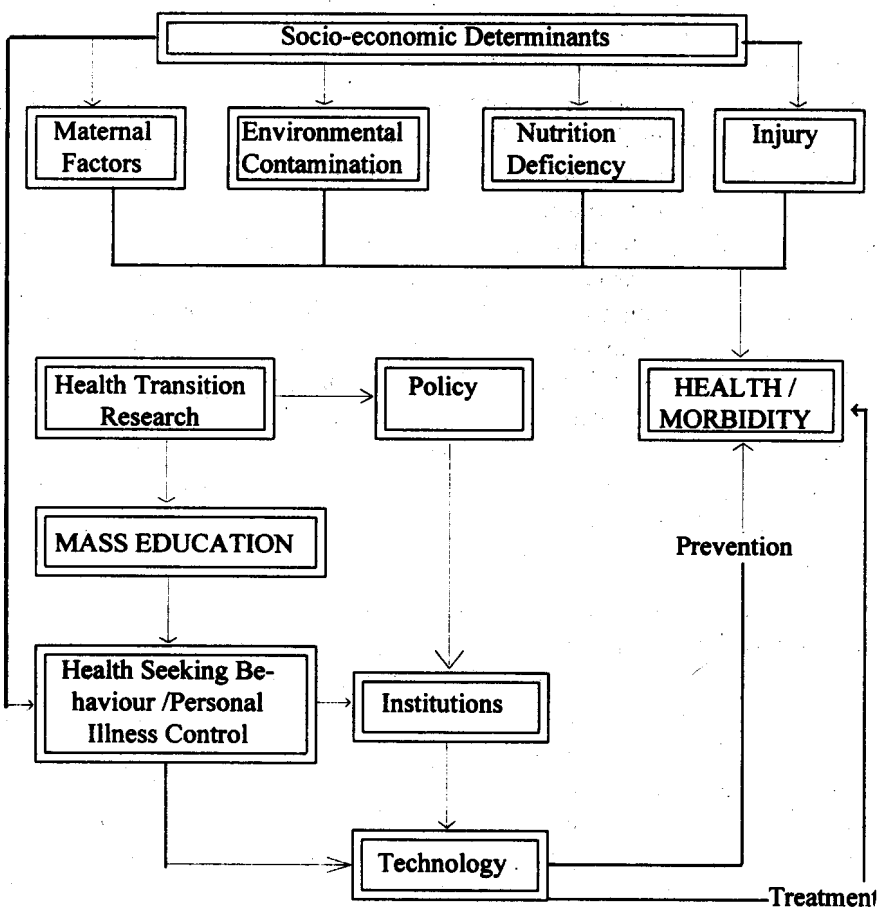
(a) Role of Mass Education

Mass education has been recognised as one of the most important national attributes which determines health of the people. A substantial fall

in morfality seems to have resulted due to the overall socio-economic and behavioural changes which have accrued due to increase in literacy and information revolution. Mass education is a 'necessary and sufficient condition' for the onset of the health transition. Education and information is the basis for the health care utilization and supply of health producing goods alone will not generate demand. 'The most economical route *to improve health and survival* is probably to spend the marginal additional investment in seeking complementary behavioural changes rather than increasing the direct medical expenditure' (Caldwell, 1990:xii). Thus as far as the health transition is concerned, both the public and private investments in mass education are the health care demand generating inputs. The demand generation through education, however, takes many routs. For example, *(a)* education will have a direct impact through a higher utilization of health care. *(b)* Demand for health care also increase because of increased income (the income elasticity of health care use is positive and greater than one) earned through education. *(c)* A third and the most important rout through which mass education would help human health is through the enhancement of 'allocative efficiency'. The allocative efficiency can be identified as the greater care and precautions which people would take against insuring the risks of ill health. Such efficiency gains are the result of behavioural changes and inculcation of rational and scientific temper which get imbibed due to mass education. It is because of such human development gains that education and health are now being viewed as the basic human rights as well.

Figure 1 presents a conceptual framework to understand the mechanisms through which the health transition research operates in bringing in improvement in human health. This schematic framework uses the basic framework for child survival presented by Mosely and Chen in 1984 which identifies the proximated determinants namely, maternal factors, environmental contamination, nutrient deficiency and injury, which determines sickness or healthiness of children. The above framework extends it further by expanding their *box* on **personal illness control** to incorporate the impact of health transition research which largely transmits through mass education and conditions the health seeking behaviour. Besides the health transition research may also influences policy which operates through the institutions and technology to improve the human health. The health seeking behaviour or the personal illness control nonetheless uses the institutions and technology more efficiently to improve the human health often independent of the policy.

Figure I. A Conceptual Framework to Understand the Impact of Health Transition Research on People's Health



Adapted from Mosley and Chen, 1984 : 29.

(b) Health Safety Net, Rural Health Insurance System

India is in the process of implementing macro-economic adjustment policies which have far reaching implications to the masses. While the policies are in the nature of fiscal and economic manipulations at the macro level, there are important consequences with respect to inter-sectoral shifts in resource allocations. Since the adjustment policies are growth oriented, the equity and distributional aspects are often ignored. It is in this connection the health is identified as one of those sectors which fall under the safety net programme. Since the beginning of the recent reforms in 1991, there seems to be a decline in real allocations of public expenditures and investment in the health and education sectors. Thus the safety net programmes seems to aim to target the smaller allocations to the most needy and also aims to improve the allocative efficiency of such expenditures. While appreciating these efforts it is emphasised that the health and education the two basis human development issues should essentially be managed by the local bodies. In this regard there is scope to develop rural health insurance structures in which the 'panchayats' (local bodies) as the grassroots level institution may insure people under its jurisdiction in an innovative insurance scheme.

7. Impact on Policy

The health transition research generally highlights the merits and demerits of the people's perceptions. Does this research helps in devising a formal appropriate health policy?

The possible factors as to why the formal public policy may be ignoring the contribution of the health transition research are cost and, budgetary constraints, lack of interest, political reasons, bureaucratic inefficiency, lack of demand and lack of people's response to policy if so designed. Given the financial constraints the policy still appears to be able to create infrastructure, and supply services and personnel. But it has failed in maintaining the quality of services over a period of time and adopt a humane approach.

Public policy in India is conceived and implemented as a partial approach. An integrated, holistic and people centered approach is missing in both conceptualization and propagation of policy. The approach is bureaucratic and there is a water tight compartment approach to policy. Public policy also appear to have a fire fighting approach, thus makes its

presence felt in case of crisis, otherwise remains silent. The public policy also address only the short term, politically rewarding and often superfluous programmes. The current emphasis on involving the NGOs in health and welfare sectors does not necessarily amounts to the people's participation.

(a) Health Transition Approach is Certainly a Viable Alternative

Health transition research intends to make health a purely choice base and private affair. This philosophy has got into the governments policy making since the past about one half decade. The Finance Minister refused to increase the public health care budget even after an outbreak of Plague in India in 1994. It is in this context that the contribution of *'health transition research'* becomes policy relevant and comes to the rescue of masses.

8. Future Challenges to the Health Transition Approach to Human Health

Research in Social Sciences is an indicator of the public commitment to address the needs of the society besides improving the programme efficiency and reducing the cost of services. Health transition research is indeed a commitment to achieve the overall objective of reducing the incidence of disease, suffering and death. The utility of this research is seen not only in improving health and longevity per se, but also improved human productivity and associated development gains.

A transition in health situation of people from high morbidity and associated high mortality to low morbidity and low mortality reflecting the natural attrition appears achievable even in developing countries. However, there may be an intermediary stage in this transition in which the morbidity will remain high as mortality itself is steeply falling.

Another diversion to health transition can be found in the distribution of diseases according to the age structure of the population. For example, the developing countries are known to be susceptible to contract a high incidence of communicable diseases as opposed to a higher proportion of degenerative diseases in the developed world. The incidence of communicable diseases do reflect the poor living condition of the masses along with peculiar behavioural stereotypes. It is by now well known that the communicable disease is high among the young population. Thus a constitution of the age profile of morbidity and type of sickness is a pointer for the need to bring in a transition in which people do become sick when old and also suffer from terminal degenerative or chronic symptoms and diseases.

Culturally sensitive reproductive health strategies, health care accessibility and care of the elderly, innovative strategies to care people suffering from diseases such as AIDS, leprosy and tuberculosis and misuse of antibiotics in the treatment regimes are all the challenges to be faced by the health transition research propagators.

It is very clear that medical and epidemiological approach to morbidity management is often relevant for innovating curative breakthrough and understand the ecology of diseases. The so called social science approach to health which has become to be known as 'health transition research' rather addresses issues which are in the realm of human behaviour necessary to invoke and sustain improved health.

The approach essentially brings us to the doorsteps of the social science such as sociology and social organization, anthropology and cultural, developmental economics and behavioural sciences. By the very nature of the shift towards a social science approach entices researchers to focus on the preventive approaches to human health.

Although the Health Transition Research has been successful in highlighting the importance of micro-household and individual level variables, so far the direct impact of the HTR on policy in India appears to be remote. It is likely that the HTR has been unsuccessful to present its findings and recommendation in a format feasible for policy formulation and implementation. It is argued that the HTR should also focus in demonstrating, if necessary through action research, feasible strategies for improving health status and also reducing inter-regional and inter-group variations.

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