Morbidity Study - Incidence, Prevalence, Consequences and Associates

P. Krishnaswami

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Contents

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1. Introduction

Background

Kerala is well known for its achievements in the field of social development – education, health, family planning, public distribution system, and land reforms. The crude death rate of 6.4 per 1000 of population, the crude birth rate of 18.0 per 1000 of population, and the infant mortality rate of 14 per 1000 live births (all for 1999; Registrar General's reports as reported in Kerala Economic Review 2001-'02) are comparable to the corresponding rates in many advanced countries. The maternal mortality rate of 198 per 100,000 live births (1998; ibid) in Kerala is much lower than the corresponding all India rate of 407.

However, paradoxical as it may seem, different studies have brought out that Kerala has the highest morbidity rate of all States in India. According to the results of the 28th round of the National Sample Survey (NSS-1974) the morbidity rate (measured in terms of acute illness during the two weeks prior to the date of survey) was 71.21 per 1000 for rural Kerala as against the all India figure of 22.46; and the morbidity for chronic illness was 83.68 per 1000 for rural Kerala as against 20.98 for all India. Similarly the 52nd round of NSS (1995-1996) arrived at the combined morbidity rate for acute and chronic ailments for Kerala as 118 per 1000 for rural and 88 per 1000 for urban as against 55 and 54 for all India. Thus Kerala presents a picture of low mortality and high morbidity.

The morbidity pattern in the State has been undergoing major changes. The ageing of the population as a result of the declining birth rate and the migration of young adults to the Gulf and other countries are factors relevant to it. Continuing change in life style involving

competition leading to pressure and tension, changes in consumption habits resulting in nutritional inadequacies and increased use of drugs, alcohol and tobacco products are other important factors.

The Kerala Statistical Institute (KSI) decided to conduct an in-depth study of the morbidity profile in eight *panchayats* in the context of the ongoing decentralisation programme in Kerala.

The specific objectives of the study are:

(i).   to obtain State level estimates for morbidity;
(ii).   to get a picture of the association of illness with age and gender parameters;
(iii).   to estimate the time lost/wasted due to morbidity; and
(iv).   to examine whether distinctly different trends in these parameters exist among socially stratified groups.

The life span of an individual in Kerala is about 70 years. Owing to morbidity, part of the expected life is, however, liable to be 'lost' through incapacitation. The study attempts to address this question. *Morbidity is an indicator of illness, which can be defined as any deviation from the state of normal physical and mental well-being.* A measure of morbidity may be in terms of prevalence during a stated period or in terms of incidence. Modern concepts deal with measurement of the burden of disease resulting from mortality and morbidity in terms of disability adjusted life years (DALY). From the results of the present survey it is not possible to work out measures like DALY. However, the conventional indicators like prevalence and incidence rates have been worked out. In addition, an attempt has been made to measure the burden of disease in terms of the number of days lost due to illness and the costs incurred by the household, through cost of treatment and through loss of household income.

Section 2 of this report gives a review of relevant literature. Section 3 gives a description of the sampling plan and data collection. The results of the study are given in section 4. Among others, they pertain to:

(i).   The association of morbidity rates with age and gender parameters.
(ii).   The association of morbidity rate with religion and with social group.
(iii).   The cost of treatment.
(iv).   The financial burden on a household due to cost of treatment and loss of income.

Concepts and definitions

Ailment, which includes illness or injury, is any deviation from the state of normal physical and/or mental well-being. Events related to normal pregnancy, childbirth and family planning procedures do not come under ailment.

Morbidity refers to the state of being afflicted with an ailment.

Chronic illness is illness persisting for a long time.

Acute illness is illness, which is not chronic. Acute illness implies a finite duration.

Morbidity prevalence rate or simply **morbidity rate** has been measured as the number of persons reporting ailment during the reference period per 1000 persons. (The prevalence rate as recommended by the WHO Expert Committee on Health Statistics is the ratio between the number of spells of ailment suffered at any time during the reference period and the population exposed to the risk. The difference, however, may only be marginal).

Incidence rate is the number of new occurrences of an illness during a specified period per 1000 persons.

Point prevalence rate is the average number of persons ill at a point of time (taken as one day in this report) per 1000 persons.

2. Review of Literature

NSS surveys

The National Sample Survey (NSS) Organisation used the household survey technique for nation-wide collection of data on morbidity in the 7th round (1953-'54), 17th round (1961-'62) and 28th round (1973-'74). In the 42nd round (1986-'87) also, data on morbidity were collected but the objective was an assessment of the benefits derived by society from public expenditure incurred by the Government in various areas, health care being one of them. The emphasis in the 42nd round thus was on hospitalised cases. In the 52nd round (1995-'96) data on morbidity and treatment of ailments were collected. The reference period was 30 days in the 17th round, 15 days in the 28th round, 30 days in the 42nd round, and 15 days in the 52nd round. The number of households surveyed in Kerala in the 52nd round was 2850 - rural and 2078 - urban.

The 28th round gave morbidity rates of 71 per 1000 for acute ailments and 84 per 1000 for chronic ailments for rural Kerala as against 22 and 21 for rural India. The morbidity in Kerala was thus more than three times the all-India figure. It was this finding that sparked off special interest in the study of morbidity in Kerala.

The 42nd round, mainly concerned with hospitalised cases, gave the proportion of persons with ailments in a period of 30 days during 1986-'87 on an all-India basis (not State-wise) as 64 per 1000 for rural and 31 per 1000 for urban. For this purpose only ailments, which were not treated as in-patients in hospital, were considered.

The NSS report on morbidity and health care based on the 52nd round has presented data on the nature of ailments, cost and sources of curative treatments, details of persons receiving hospitalised and non-hospitalised treatments, utilisation of various public health care facilities and private expenditure on medical treatment, besides morbidity rates for acute and chronic ailments. According to the results of the 52nd round, the morbidity rates were 80 per 1000 for acute ailments and 38 per 1000 for chronic ailments for rural Kerala leading to a total of 118 per 1000 for the rural. The corresponding rates for India were 42 for acute and 13 for chronic with a total of 55 per 1000 for the rural. For the urban, the rates for Kerala were 61 per 1000 for acute ailments and 27 per 1000 for chronic ailments, the total being 88 per 1000. The corresponding rates for India were 41 per 1000 for acute ailments and 14 per 1000 for chronic ailments, the combined rate for the urban being 54 per 1000 for acute and chronic ailments together. Kerala continues to top the list. Whereas in 1973-'74 the Kerala rate was over three times the rate for India, in 1995-'96 it was just about twice.

KSSP surveys

The Kerala Sastra Sahitya Parishad (KSSP), which is actively engaged in people's health movement, carried out a People's Health Survey in 1987, the results of which are given in the volume *Health and Development in Rural Kerala* (Kannan K. P, et al, 1991). The survey was conducted in all the 1001 *panchayats* during 1 to 10 July 1987. The number of households

visited was 10 per *panchayat*, the total number of households thus being 10,010. The morbidity rate for acute diseases based on a 15-day recall period was 206.39 per 1000 as against 71.21 according to 28th round of NSS carried out in 1974. The prevalence rate for chronic diseases came out as 138.02 as against the corresponding 28th round NSS figure of 83.68.

KSSP carried out a repeat survey in 1996 in 10 percent of the households covered in the original study. The number of households was thus of the order of 1000. This repeat survey was conducted during one week in July 1996. The morbidity rate for acute diseases came down from 206.39 to 121.86 and for chronic diseases from 138.02 to 114.60. In each socio-economic class, there was approximately 40 percent decrease in acute morbidity. As regards chronic morbidity the decrease ranged from 35 percent in the lowest socio-economic class to 9 percent in the highest. The survey of 1987 and the repeat survey of 1996 were conducted under the supervision of the same organisation. The method used, the reference period, and the month of survey were the same. The substantial reduction in morbidity may be explained on the basis of an actual reduction in morbidity, change in the disease perception of people, investigator bias or other estimation errors, probably by a combination of all these factors. A limitation of both these studies is that they were carried out during one week in July and hence did not provide for seasonal variation. Besides general morbidity rates, the KSSP studies obtained disease-specific morbidity rates and also examined gender differences in morbidity rates, the type of treatment taken, the cost of treatment and the utilisation of the health care system. Based on a comparison of the costs of treatment, as obtained from the 1987 study and the repeat study of 1996, the report has mentioned that the increase in cost of treatment is much more than what is warranted by the increase in cost of living. The results of the survey contained in the paper *Changes in the Health Status of Kerala 1987-1997* by T. P. Kunhikannan and K. P. Aravindan (2000) indicates that the probability of an actual reduction in morbidity is corroborated by the reduction in communicable diseases from 67.44 percent of the overall morbidity in 1987 to 57.93 percent in 1996.

Studies by Panikar

Panikar carried out a similar study in 1995 in the districts of Thiruvananthapuram, Alappuzha, and Malappuram based on a survey of 1000 households from each of the three districts. The data were collected in four rounds spread over one year with a reference period of two weeks. The results showed a load of 78.9 per 1000 for acute morbidity and 58.6 for chronic morbidity (Panikar P.G. K, 1999).

NCAER survey

The National Council of Applied Economic Research (NCAER) carried out a household survey of Health Care Utilisation and Expenditure in 1993 all over India. Of the total of 18693 households surveyed 731 (490 urban and 241 rural) were from Kerala spread over all districts. The period of the survey was two months (May-June 1993). According to the report on the survey entitled 'Household Survey of Health Care Utilisation and Expenditure' by Ramamani Sundar (NCAER, 1995) the total morbidity rate of Kerala was 194.8 per 1000 for the rural and 183.9 per 1000 for the urban. These were higher than the corresponding all-India figures of 106.7 and 103.0 obtained from the same survey. Two factors are to be taken into

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consideration while examining these figures. One is that these rates relate to all illnesses together, both acute and chronic. The second is that the reference period was one month and not 15 days. The NCAER study gave the prevalence rate for acute and serious communicable diseases for Kerala as 130.2 per 1000 and for chronic diseases as 64.7 per 1000 for the rural and 134.3 per 1000 and 49.6 per 1000 for the urban. The corresponding all-India figures were 93.5 and 13.2 for the rural and 84.6 and 18.4 for the urban. Combining the rural and urban figures with weights of 0.74 and 0.26 for Kerala and 0.72 and 0.28 for all India (the relative proportions of the rural and urban population according to Census 2001), the rates for Kerala came to 131.3 per 1000 for acute illness and 60.8 per 1000 for chronic and for all India 91.0 for acute illness and 14.7 for chronic illness. The fact that the reference period was one month (and not 15 days as in the KSSP surveys) makes a difference for the acute ailments. A few of the episodes of illness starting before the first day of the reference period and continuing on the date of survey would be common to 15 days reference period and one month reference period. Hence the rate based on 15 days reference period could be slightly more than half of the rate based on one-month reference period.

Study by Ittiyamma

Ittiyamma carried out an investigation in 1998 in a Public Health Centre (PHC) comprising coastal and non-coastal areas in its jurisdiction and obtained 108.2/110.95 per 1000 as the rate for acute ailments and 117.25/153.14 per 1000 as the rate for chronic ailments.

Review

There was a marked difference between the morbidity rate for acute illness of 71.21 obtained by NSS in 1974 (28th round) and the corresponding rate of 206.39 obtained by KSSP in 1987. The rate for chronic illness also differed sharply, 83.68 as obtained by NSS in 1974 (28th round) and 138.2 as obtained by KSSP in 1987. The KSSP study of 1996, however, showed a sharp fall in the rates as compared to their 1987 study, from 206.39 to 121.86 for acute and from 138.02 to 114.6 for chronic. The study by Panikar (1995) indicated still lower rates of 78.9 for acute and 58.6 for chronic ailments. The NCAER study (1993) indicated a rate close to Panikar's results for acute morbidity if allowance is made for the difference in reference period. As regards chronic morbidity also, the NCAER figure of 60.8 is comparable to the rate of 58.6 obtained by Panikar (1995) but lower than the rate of 114.60 obtained by KSSP in 1996. The rates obtained for Kerala by NSS in their 52nd round (July 1995-June 1996) were 80 per thousand for acute and 38 per thousand for chronic in the rural and 61 per thousand for acute and 27 per thousand for chronic for the urban.

Gopalakrishna Kumar examined the 'puzzle' of high morbidity in an environment of low mortality and reasoned that it could well be another facet of Kerala's success in controlling premature mortality. According to him, if the quality and coverage of medical attention is good, it is possible for the population to suffer from adverse conditions in terms of health and nutrition reflected in high morbidity, and yet have a low mortality rate. Amartya Sen (1996) agreed that high morbidity and low mortality could coexist in Kerala because of wide coverage and good quality of health care. However, according to Krishnan as quoted by Panikar (1999) inter-State comparisons of morbidity, based on data almost solely collected

by NSS at a single point of time, may not be valid because the comparisons do not refer to similar ecological, environmental, and socio-economic situations.

Duration and number of samples for the present study

Rural and urban households in Kerala were included in the 52nd round of NSS. The KSSP studies covered the entire rural area of Kerala. In the 1987 KSSP study, 10 households from each of the 1001 *panchayats* were included in the survey, and in the 1994 study 10 percent of the households studied earlier were taken up. The NCAER study was also on a national basis and included 241 rural households and 490 urban households in Kerala. Panikar's study was restricted to three districts. Itiyamma's investigation was restricted to the area under the jurisdiction of one PHC.

The main thrust of the present study was to obtain morbidity rates for the various geographical regions of Kerala. Rates were thus to be obtained for the urban sector and the highland, lowland, and midland areas of the rural sector. For this purpose the sample for working out morbidity rates has to include a sufficiently large number of persons in each sector. A rough estimate of the required sample size could be worked out on the following basis. If the morbidity rate is actually of the order of 100 per thousand or 10 percent, the standard error of the estimate from a sample of n persons would be "(10x90/n) which works out to 30/"n. Twice this becomes 60/"n. This has to be equated to 0.5 if the estimate has to be obtained within a limit of 5 per thousand or 0.5 percent. It may be seen that the minimum number of persons has to be of the order of 14400 or that the number of households has to be of the order of at least 3000 for the smallest sector. This has been ensured in our survey. The morbidity rates for the State are based on data collected from 38400 households in all, out of which 4400 were in the highland, 5200 were in the lowland, 16000 were in the midland, and 12800 were in the urban.

Morbidity rates had to be worked out for individual ailments also. Further, consequences of disease and burden of disease had to be examined in terms of number of days lost, cost of treatment, loss of income, and other related factors. For this purpose a sub-sample consisting of 3840 households (all of which reporting at least one ailment) was studied, ensuring that a reasonably large number of chronic cases and cases among children were captured. The total number of episodes of acute ailments studied was 3337, which included 994 among children in the age group 0-4. The total number of chronic cases studied was 1317. (In the NSS 52nd round the number of ailing persons studied were 1506 in rural Kerala and 848 in urban Kerala.) The collection of field data commenced by the middle of February 2000 and was over by the middle of February 2001.

The reference period was 15 days in the 28th and 52nd rounds of NSS (1973 and 1986) and in both the KSSP studies (1987 and 1996). Panikar's study (1995) also used a two-week reference period. For the NCAER study (1993) and the 42nd round of NSS (1986) the reference period was 30 days. Acute ailments generally get cured within 15 days. A reference period of 15 days prior to the date of the survey for acute diseases was used for the present study since it was considered short enough not to cause serious distortions due to recall lapse. Chronic ailments in some cases show up in one or more spells in a year.   In cases

where there was no spell in the recent past the investigator may have a doubt as to whether it should be recorded as a chronic ailment or not. To avoid such ambiguities in the present survey the reference period for chronic ailments was taken as 12 months prior to the date of survey

As regards the period of survey, since seasonal variations in morbidity are to be accounted for, it is imperative that the survey is done over one full year. All the rounds of NSS are for one full year. Both the KSSP surveys were done in 10 days in July. The NCAER survey was done in the two months, May and June. Panikar's study was carried out in four rounds of three months each over one year but the data for one sub-round was not included because of some errors. In the present study, the survey was spread uniformly over four sub-rounds of three months each.

3. Sampling Techniques and Data Collection

Sampling

Sampling is crucial for attaining the objectives of the present study. A two-stage sampling design was adopted. *Panchayat* wards in the rural areas and municipal/corporation wards in the urban areas constituted the first stage. Households constituted the second stage.

Districts constituted the basic strata. In the rural sector, the sample *panchayat* wards were first allocated to the districts in proportion to the 1991 census population. The Corporations of Thiruvananthapuram, Ernakulam, and Kozhikode and all other district headquarters constituted separate strata. All other towns within the district constituted another stratum. In general, sample urban wards were allocated to different strata in proportion to the urban population. The sample wards in the rural sector were allocated to highland, lowland, and midland *panchayats* roughly in proportion to the population in these three natural regions.

The list of *panchayat* wards constituted the sampling frame for the rural sector. Likewise the list of corporation/municipal wards constituted the sampling frame for urban locations. The sample wards within a stratum were selected by simple random sampling without replacement. The samples were taken in the form of two independent inter-penetrating sub-samples. As far as possible different investigators were assigned to sub-sample 1 and sub-sample 2 of each locality. The survey was conducted in four sub-rounds of three months each to provide for seasonal variation. Each sample was thus allocated to one sub-round (out of four) and to one sub-sample (out of two). The district-wise and the sector-wise distributions of the 192 sample wards are given in Table 3.1 and 3.2.

Data collection

With regard to each sample ward, the investigator collected information regarding infrastructural facilities. In each sample ward 200 households were selected as a cluster with a random start. From each of the 200 households thus selected within the sample ward, the investigator collected basic data regarding the household size and the number of members reporting chronic ailments, the number of members aged 0-4 reporting acute ailments, and the number of members aged 5 and above reporting acute ailments during the reference period. For chronic ailments the reference period was 365 days and for acute ailments 15 days. On the basis of the data regarding persons reporting ailments, the 200 households were grouped into four mutually exclusive sub-strata:

(i).   Sub-stratum 1: households reporting chronic ailments irrespective of acute ailments among any age group.
(ii).   Sub-stratum 2: households reporting acute illness among persons aged 5 + irrespective of acute ailments among children aged 0-4 but not reporting chronic ailment.
(iii). Substratum 3: households reporting acute illness among children aged 0-4 but not reporting acute ailment in the age group 5 + or chronic ailment.
(iv).   Sub-stratum 4: households not reporting any illness.

Table 3.1   Distribution of first stage sampling units by district

District	Rural		Urban	
	Sub-sample 1	Sub-sample 2	Sub-sample 1	Sub-sample 2
Kasaragod	2	2	2	2
Kannur	4	4	2	2
Wayanad	2	2	1	1
Kozhikode	6	6	3	3
Malappuram	8	8	2	2
Palakkad	6	6	2	2
Thrissur	6	6	2	2
Ernakulam	6	6	5	5
Idukki	2	2	1	1
Kottayam	4	4	2	2
Alappuzha	4	4	2	2
Pathanamthitta	2	2	2	2
Kollam	6	6	2	2
Thiruvananthapuram	6	6	4	4
Kerala	**64**	**64**	**32**	**32**

Table 3.2   Distribution of first stage sampling units by region

Sub-round	*1*		*2*		*3*		*4*		*All*	
Sub-sample	*1*	*2*	*1*	*2*	*1*	*2*	*1*	*2*	*1*	*2*
Lowland	3	3	4	2	2	5	4	3	13	13
Midland	12	8	8	12	12	8	8	12	40	40
Highland	4	2	1	5	4	1	2	3	11	11
Urban	15	1	4	12	12	5	1	14	32	32

For collecting detailed data pertaining to the households and the ailments, 5 households from Sub-stratum 1, 5 households from Sub-stratum 3, and 10 households from Sub-stratum 2 were selected by linear systematic sampling. If the total number of households in Sub-stratum 1 or Sub-stratum 3 was less than 5 in any sample ward, all the households in that sub-stratum were selected and correspondingly more than 10 households were taken from Sub-stratum 2. Thus data on prevalence of illness were collected from 200 households and detailed data in respect of each case of ailment from 20 households from each of the 192 wards that constituted the first stage sample.

Apart from data regarding illness the detailed information collected included basic demographic particulars of normal resident members including name, relationship to the head of the household, sex, marital status, age at marriage, educational level, activity status, and monthly income and monthly expenditure.

For each member it was noted whether he/she was ill at any time during the reference period.

Sickness or illness or ailment meant any deviation from the state of physical or mental well-being. Whether an individual was ill or not was based on his/her perception, except in the case of children for whom it was based on the perception of the mother/father or any other senior member of the household. Injury was also considered as an illness. Pregnancy, childbirth, etc., were not taken as ailments. The reference period was 15 days for acute illness and 365 days for chronic illness.

For each episode of acute illness, the following information was noted:

(i)   the nature of illness; for this purpose a list of 76 ailments based on the International Classification of Diseases was drawn up;
(ii)   the status of the ailment in terms of four mutually exclusive categories–
         (a) started and ended within the reference period;
         (b) started earlier and ended within the reference period;
         (c) started within the reference period and continuing on the day of the survey; and
         (d) started before the reference period and continuing on the day of the survey;

(iii).   the date of commencement of the current spell;
(iv)   the duration within the reference period;
(v)   whether the ailment was treated or not, if not treated why;
(vi)   the source of treatment;
(vii)   the system of medicine;
(viii)   whether the ailment resulted in incapacitation and if so the number of days of incapacitation;
(ix)   whether the ailment prevented the individual from doing his normal work (in the most general sense, including attending office, attending school, doing household work or even just playing in the case of children), if so for how many days;
(x)   whether the person was hospitalised for the ailment, if so type of hospital, system of medicine, and duration of stay in the hospital;
(xi)   whether the treatment involved surgery; and
(xii)   the cost of treatment.

Chronic illness was taken as long continued illness. For each case of chronic illness the following relevant details were recorded:

(i)   the nature of illness in terms of the list;
(ii)   the current status – very severe, severe, not severe;
(iii)   whether the treatment was taken on a regular basis;
(iv)   the system of medicine;
(v)   details of hospitalisation;
(vi)   whether the ailment resulted in incapacitation, if so degree and period;
(vii)   whether it prevented the individual from attending to work, if so period; and
(viii)   the cost of treatment.

In addition to all these details regarding the illness, the household monthly consumer expenditure with medical expenditure as a separate item was also recorded.

The KSI prepared draft schedules for collection of data and carried out a pilot enquiry in Thiruvananthapuram and Kottayam during December 1999. The experience gained from it was used to refine the concepts and finalise the schedules. The actual fieldwork commenced by the middle of February 2000 and was over by February 2001. The survey was spread evenly over one full year to provide for seasonal variation.

The field investigators were men and women specially selected and trained for the project. They were all graduates and belonged to the districts where they were assigned work. The supervisors were staff of KSI who had long experience in the collection of socio-economic data through large-scale field surveys. Apart from routine field supervision, the data collected by the investigators were subjected to detailed checks. If there were doubts, the investigators were asked to clarify. If they were not able to clarify the doubts they were sent back to the particular households for verification of the data. With these special efforts KSI was able to reduce the unit level non-response to zero. Thus data on the number of persons with ailment during the reference period were available from 38400 households in all and detailed data in respect of each case of ailment from 3840 households.

4. Analysis and Interpretation of Results

All the results obtained from the study are presented in this section.

General morbidity

Morbidity rates

The general morbidity rate in terms of prevalence during the reference period has been worked out as the number of persons reporting illness per 1000 persons exposed to the risk during the reference period. As already mentioned this is marginally different from the WHO definition according to which the prevalence rate is the number of ailments reported during the reference period per 1000 persons exposed to the risk. Data were collected from 200 households in each of the 192 first stage sample wards. The number of persons reporting acute illness was recorded separately for age 0-4 and for age 5 and above with a reference period of 15 days. The number of persons reporting chronic illness was also recorded, with a reference period of 365 days. These figures together with the household size were used to work out the morbidity rate for acute and chronic illness. Thus for each household size, from 192 samples of 200 households, the number of persons of age 0-4 reporting ailment, the number of persons of age 5 + reporting ailment, and the number of persons reporting chronic ailment were available. The land sector (rural highland, rural lowland, rural midland, rural, urban) corresponding to the particular sample ward and the corresponding sub-sample number (first or second) were also available for each of the 192 sample wards. The morbidity rates for the first sub-sample and for the second sub-sample for each category were worked out separately and then pooled to get the combined estimates. The rates for the rural sector could be obtained by pooling the data for highland, lowland, and midland since the samples had been allotted in proportion to the population of these categories. The State-level estimates were obtained by combining the rural and the urban rates with weights of 0.74 and 0.26, which represent the relative population composition of Kerala according to the 1991 Census as well as the 2001 Census.

The morbidity rates per 1000 for acute illness and chronic illness worked out from the survey results are given in Table 4.1. The number of persons reporting ailments and the corresponding number exposed to the risk are given in Appendix Table 1.

A comparison with the rates obtained from different studies is given in Table 4.2.

The rates obtained from the present study are lower than the KSSP rates of 1996 which themselves were much lower than the KSSP (1987) rates. Both the KSSP surveys were conducted during a period of 10 days in July which falls within the peak monsoon period. The results obtained from the present study are comparable to those of Panikar (1995) except that the acute rates are somewhat lower. But Panikar's study was also restricted to three districts and the analysis took into consideration data from only three of the four rounds. Ittiamma's study (1998) was restricted to a small locality.

Table 4.1 Morbidity rates by land sector

Sector	Morbidity rate per 1000 of total population				
	Ailments (age0–4)	Ailments (age 5 and above)	Ailments all ages	Chronic ailments	Total
Rural highland	14.66	39.82	54.49	63.42	117.91
Rural lowland	16.88	51.33	68.21	51.43	119.64
Rural midland	14.71	39.93	54.63	64.53	119.17
Rural	15.13	42.21	57.35	61.71	119.05
Urban	14.63	43.90	58.53	68.73	127.26
State	15.00	42.65	57.65	63.53	121.19
Census1991	*163.93	*46.95			

*Estimated rates per 1000 of population in the age groups of 0-4 and 5+, based on their relative composition (9.15 percent and 90.85 percent) according to the Census 1991.

Figure. 4.1   Morbidity rates - acute and chronic
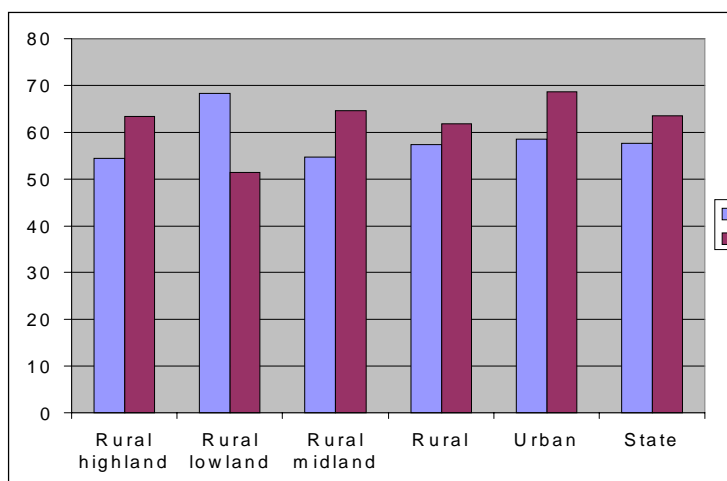
As regards the NSS results (52nd round 1995-'96) the total morbidity for the rural is in agreement with the result from the present study. There is, however, some difference if acute and chronic are taken separately. A possible reason could be the difference in the reporting and recording of chronic ailments. The reference period for chronic ailments was deliberately taken as one year in the present study. Since the nature of the ailment had to be recorded based on the perception and understanding of the respondent, instructions were kept simple in the present study. Any ailment cured or likely to be cured within a finite period was to be taken as an acute ailment; any ailment which was of long duration or was showing up in repeated spells was to be recorded as chronic ailment. (Wherever possible available documents such as certificates by the attending doctors, prescription notes, discharge certificates from hospitals etc. were also to be consulted for deciding the nature and type of

Table 4.2 Morbidity rates per 1000 for Kerala from different studies

Sector	Ailment	Present study 2000	NSS 52nd round 95-96	KSSP 1996	KSSP 1987	Panikar 1995
Rural	Acute	57	80	122	206	79
	Chronic	62	38	115	138	59
	Total	119	118	237	344	138
Urban	Acute	59	61	-	-	-
	Chronic	69	27	-	-	-
	Total	127	88	-	-	-

*The NCAER acute rates were based on a reference period of 30 days. The figures in brackets give the rates after an approximate conversion of the acute rates to a 15-day reference period.

ailment.) For instance, since neither the respondents nor the investigators could distinguish between different types of heart problems; all heart ailments were taken as chronic in the present study. The NSS study (52nd round 1995-'96), however, took heart failure as acute and diseases of the heart as chronic. Further, ailments with duration of 30 days or more were taken as chronic and ailments with duration less than 30 days were taken as acute in the NSS study. Such differences could have resulted in some chronic ailments having been overlooked and some classified as acute. This could have led to a higher acute rate and a correspondingly lower chronic rate (the total remaining more or less the same) as compared to the present study.

While the total morbidity rate for the rural obtained from the present study agrees closely with the corresponding rate from the NSS (52nd round 1995-'96), the total rate for the urban is higher (128 per 1000 as against 88 per 1000). The acute rates for the urban agree (59 per 1000 from the present study and 61 per 1000 from the NSS 52nd round) whereas the chronic rates differ (69 per 1000 from the present study as against 27 from the NSS study). An inspection of the total morbidity rates (acute and chronic together) for different States given in the report of the 52nd round brings out that the urban and the rural rates are close to each other in all the States except Kerala where the difference is as large as 30 and that the rates for rural and urban India are almost the same (55 per 1000 and 54 per 1000). A substantially lower morbidity rate in the urban (as compared to the rural), particularly a lower chronic morbidity rate, is difficult to explain. In fact, it is known that the rural-urban divide is thin in Kerala. A possible interpretation is that the some chronic ailments could have been missed because of the short reference period.

On the basis of the above discussion it appears that the morbidity rates obtained from the present study as given in Table 4.1 give reasonably good estimates of acute morbidity and chronic morbidity for the rural and for the urban. A comparison of the morbidity rates obtained from the present study for acute and chronic ailments for the different sectors (urban and rural and also highland, lowland, and midland within rural) will be taken up later in this Section.

Incidence rate

The incidence rate is the number of new episodes of illness per 1000 persons exposed to the risk occurring during a specified period. This is applicable only to acute ailments. For such ailments the proportion of cases that started during the reference period is available from the survey results. By multiplying it by the corresponding morbidity rates given in Table 4.1, the incidence rate has been worked out. The incidence rate relates to a period of 15 days. The distribution of the episodes of illness by status is given in Appendix Table 9. The episodes that started within the reference period and either ended during the reference period (status 1) or continued beyond the reference period (status 3) are relevant for working out the incidence rate.

The incidence rates obtained from the survey results are given in Table 4.3.

Table 4.3 Incidence rates

Sector	Incidence rate per 1000 for a period of 15 days		
	Acute Illness age 0-4	Acute Illness age 5 & above	Acute Illness all ages
Rural	13.45	33.92	47.37
Urban	13.26	35.01	48.27
State	13.40	34.20	47.60
Census 1991	*146.45	*37.64	

*Estimated rates per 1000 of population in the age groups 0-4 and 5+ based on their relative composition (9.15 percent and 90.85 percent) according to the Census 1991.

Point prevalence rate

The point prevalence rate gives the prevalence rate at a point of time. The number of cases prevalent on the date of survey is known from the status of the disease. In Appendix Table 9, the third and fourth categories together are relevant for the point prevalence rate. By multiplying the proportion of these two categories by the morbidity prevalence rate given in Table 4.1 the point prevalence rate was obtained. The point prevalence rates obtained thus are given in Table 4.4.

Multiplying the point prevalence rate of 20.39 by 365, a figure of 7442 is obtained which indicates that for 1000 persons, the total time lived with illness is 7442 days in a year, not taking into consideration chronic illness.

Since chronic illness is present throughout the year though with varying degrees of incapacitation, the prevalence rate for chronic illness can be added to the point prevalence rate for acute illness. If this is done, the point prevalence rate becomes 83.92. This would be an exaggerated estimate since many persons reporting chronic ailments such as diabetes and blood pressure would have been quite fit during a good part of the year.

Table 4.4 Point prevalence rates

Sector	Point prevalence rate per 1000 of total opulation		
	Illness age 0-4	Illness age 5 & above	Illness all ages
Rural	4.13	15.93	20.06
Urban	3.70	17.62	21.32
State	4.02	16.37	20.39
Census 1991	*43.93	*18.02	

*Estimated rates per 1000 of population in the age groups 0-4 and 5+ based on their relative composition (9.15 percent and 90.85 percent) according to the Census 1991.

Morbidity for different ailments

Mode of working out morbidity rates for specific ailments

For calculating morbidity rates for specific ailments, the detailed data collected from the sub-samples of 20 households out of the 200 households of each of the 192 sample wards were used. From these the number of episodes of acute ailments (separately for age 0-4 and 5+) is available for each type of ailment. Similarly the number of cases of chronic ailments is also available for each disease. From these the proportion of morbidity due to a specific disease was worked out and this proportion applied on the general morbidity to get morbidity rate for the particular disease. For instance, the general morbidity rate for chronic ailments in the rural is 61.71 per 1000. The total number of cases of chronic ailments in the rural is 835 out of which diabetes accounts for 128 and hence the morbidity rate for diabetes in the rural is 61.71x128/835 which gives 9.46 per 1000. The morbidity rates for acute ailments (separately for age groups 0-4, 5+ and also for all ages) and chronic ailments worked out as indicated above are given in Appendix Tables 5 to 8.

Acute morbidity by disease/disease group for the age group 0-4

In this age group the following six major groups – water-borne diseases, respiratory diseases, fever non-specific, infectious diseases like measles and mumps, diseases of skin, and diseases of ear accounted for about 97 percent of cases. Whereas water-borne diseases constitute 5.27 percent, respiratory diseases and fever non-specific are the two largest groups accounting for 38.43 percent and 48.04 percent respectively. It is possible that there could have been some mix-up among influenza, fever and disorders of the upper respiratory tract, both the respondent and the investigator being laymen/women. A substantial proportion of fever non-specific could have been due to respiratory infections. This would mean that the contribution of respiratory diseases to morbidity among children aged 0-4 could be still higher.

The group of respiratory diseases and fever non-specific accounts for 86.47 percent of the morbidity among children aged 0-4. This group has a morbidity rate of 12.98 per 1000 of total population. The population aged 0-4 constitutes 9.15 percent of the total population according to the Census 1991 figures; hence a conversion factor may be multiplication by 1/

0.0915. On this basis, the morbidity rate for respiratory diseases and fever is equivalent to 141.86 per 1000 children of age 0-4 in terms of morbidity during the reference period of 15 days. Water-borne diseases showed a much lower morbidity of 0.79 per 1000 of total population equivalent to 8.63 per 1000 of children of age 0-4.

Acute morbidity by disease / disease groups – age 5 and above

The morbidity rates for persons aged five and above are given in Appendix Table 6. Water-borne infections account for only 3.35 percent and are thus less important in this age group than for children aged 0-4. The morbidity rate is only 1.43 per 1000 persons of the total population or 1.57 per 1000 of population in the age group 5 and above (using a multiplication by 1/0.9085 as a conversion factor since the population of age 5+ is 90.85 percent of the total population according to the Census 1991 figures) as against 8.63 per 1000 of children in the age group 0-4. Similarly respiratory diseases and fever non-specific account for only 61.85 percent in this age group as against 86.47 in the age group of 0-4. The corresponding morbidity rates are 26.38 per 1000 of the total population or 29.04 per 1000 of population in the age group 5 and above, as against 141.86 for the age group 0-4. There are some cases of diabetes, heart ailments, rheumatism and blood pressure reported as acute illness. Normally such cases would have been reported as chronic but probably they were of recent incidence and the persons concerned were not sure that they would continue as chronic cases. Injuries constitute an important element in the age group 5 and above accounting for 3.61 percent of morbidity and a morbidity rate of 1.55 per 1000 of total population or 1.71 per 1000 population in the age group 5 and above.

Diseases of the skin, ear, and eye and dental problems account for 9.37 percent of the morbidity. In particular dental problems as a group constitutes 2.58 percent, the morbidity rate being as high as 1.10 per 1000 of the total population or 1.21 per 1000 of population aged 5 and above.

Acute morbidity by disease / disease groups – all ages

The morbidity rates for all ages for individual diseases/groups of diseases are given in Appendix Table 7. As can be expected the rates are close to the results for the age group 5 and above.

Water-borne infections account for 3.92 percent of the total acute morbidity and have a morbidity rate of 2.26 per 1000. For this group of diseases – diarrhoea, typhoid and jaundice – the rate was 25.08 according to KSSP (1987) and 2.81 according to KSSP (1996). Such a reduction from 25 per 1000 to about 3 per 1000 could have been possibly due to a substantial improvement in availability of protected water for drinking and in sanitary facilities. The results of a study carried out by KSI (1999) in 10 localities (7 rural and 3 urban) over a long period indicated that there was indeed improvement in these factors. During the period 1986 to 1996, the average population of households with protected sources of drinking water increased from 90 to 94 percent and the average proportion of households with good sanitation increased from 45 to 72 percent. However, whether these improvements would have caused such a substantial reduction in morbidity rate is a debatable question.

The morbidity rate for the serious communicable diseases group comprising typhoid, malaria, cholera, gastroenteritis, jaundice, mumps, measles, chickenpox, and TB according to the NCAER (1993) study was 15.6 for rural and 14.0 for urban (combined estimate 15.2) for all-India as against 18.8 for rural and 8.7 for urban for Kerala (combined estimate 16.2) both being of the same order. The present study has arrived at an estimate of 4.79 per 1000 (after including the TB component of 1.86 from the chronic list) which is much lower than the NCAER figure. The KSSP (1996) estimate for this group of acute diseases is 3.90 per 1000. If the TB component from the chronic category (4.16) is also added to it, the rate would be 8.06 per 1000. The rate of 4.77 obtained from the present study is lower and could reflect a further reduction in communicable diseases.

The morbidity rate for ailments relating to ear and eye according to the present survey is 2.08 per 1000. If the chronic component of 0.89 is added to it, the rate becomes 2.97. The rate for Kerala obtained by the KSSP (1996) study is 1.5 per 1000 for ear and eye ailments which is less than the rate of the present study, but of the same order.

According to the present study, the morbidity rate for skin ailments is 2.62 when the acute rate of 1.47 and the chronic rate of 1.15 are taken together. The KSSP (1996) study has estimated the morbidity due to skin diseases as 5.24 per 1000. The two estimates for Kerala are of the same order. Perhaps there is some indication of a marginal fall in the Kerala rate between the KSSP (1996) result and the present study (2000).

Dental ailments, according to the present study, have a morbidity of 1.11 per 1000 (including the acute rate of 1.14 and the chronic rate of 0.05). The KSSP (1996) study has given the morbidity for dental diseases as 1.31 per 1000 which is of the same order. The recognition of dental ailment as an illness requiring attention is a welcome indication of the awareness of the people in matters relating to health and hygiene.The group of respiratory diseases and fever accounted for 69.18 percent of the morbidity with a rate of 39.88 per 1000. The KSSP study arrived at a rate of 67.95 for fever and 4.15 for respiratory diseases totalling to 72.10. The estimate from the present study is lower.

Figure. 4.2 Morbidity for acute ailments (57.65 per 1000)
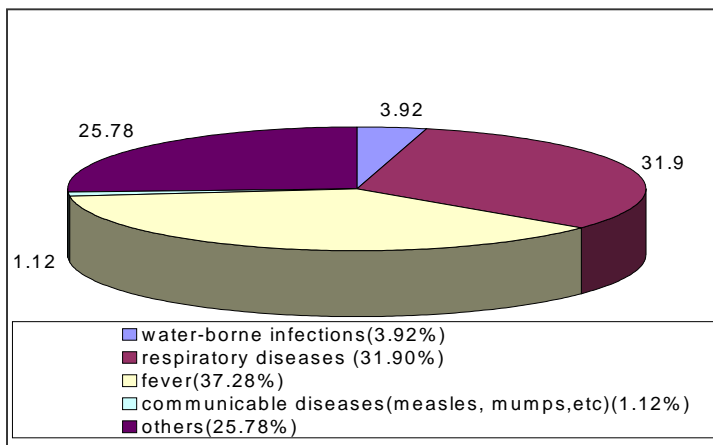
Ailments not classified elsewhere

A comprehensive list of diseases was used for the survey to ensure that the number of 'ailments not listed elsewhere' is small. The investigators had been specifically asked to provide whatever additional information they could get in respect of such cases. Of the total of 3337 cases of acute illness, 104 were reported as 'ailments not classified elsewhere', which is 3.12 percent. Out of the 104 cases of 'ailments not classified elsewhere', only 5 were from the age group 0-4, out of which one was fever resulting from inoculation, one was some minor oral abscess, one was speech and hearing defect, and the remaining two unspecified. For the age group 5 and above, the bulk (71.72 percent) of the 99 cases of 'ailments not classified elsewhere' was pain in some part of the body. A break-up is given in Table 4.5.

Table 4.5 Break-up of ailments among persons aged 5 and above

Ailment not classified elsewhere	Number	Per cent
Back pain	37	37.38
Leg pain	22	22.22
Arm pain	6	6.06
Body/shoulder pain	6	6.06
Swelling on legs/arms/body	5	5.05
Others:		
Giddiness	2	4.04
Corn	1	
No hunger	1	
Unspecified	19	19.19
Total	99	100.00

Chronic morbidity by type of ailment

The prevalence rates for various chronic ailments are given in Appendix Table 8. Diabetes, blood pressure, asthma, rheumatism, and heart ailments accounted for 72.48 percent, with morbidity rates ranging from 10.82 per 1000 for diabetes to 6.85 per 1000 for heart ailments. Mental disorders accounted for 2.58 percent with morbidity rate of 1.63 and cancer accounted for 2.38 percent with morbidity rate of 1.50 per 1000. Tuberculosis, pulmonary and non-pulmonary, accounted for 2.96 per cent of the chronic morbidity, with a rate of 1.86 per 1000.

Of the total 1317 chronic cases, 25 were reported as 'ailments not classified elsewhere'. These were miscellaneous complaints such as pain or swelling in some parts of the body, giddiness, persistent sneezing, and wearing out of bones.According to the present study diabetes tops the list of chronic ailments with a morbidity rate of 10.82. The KSSP (1996) study has given it a chronic morbidity rate of 5.5 per 1000. Perceived morbidity rate seems

to have registered an increase, which could be due to actual increase as a result of the changes in life style or better detection or both.

Blood pressure is the next in order of chronic ailments with a morbidity of 10.60 per 1000. This is less than the rate of 23.0 obtained from the KSSP (1996) study. One cannot think of any reason why there should be a reduction in morbidity due to blood pressure. A person with blood pressure complaint has to keep it in control by continued medication. An examination of the data on multiple chronic ailments observed in the present study has revealed that blood pressure is the ailment associated with the largest number of other chronic ailments such as heart ailment. Perhaps some persons with both blood pressure and heart ailment would have reported both, whereas some would have reported only heart ailment.

Asthma has a chronic morbidity of 10.25 per 1000 according to the present study as against 14.3 per 1000 according to the KSSP (1996) study. Panikar (1995) has reported a rate of 12.9 per 1000. All these are of the same order but there does appear to be a marginal reduction. The factors associated with asthma are atmospheric pollution, tobacco use, ageing, and living habits. Smoking has been showing a decreasing trend. According to a study carried out in 10 localities by KSI (1999), the average proportion of households incurring expenditure on smoking has gone down from 71.0 percent in 1981 to 50.4 percent in 1996. Perhaps this is a factor which could have contributed to a reduction, if at all there is any.

Rheumatism has a chronic morbidity of 7.57 per 1000 and arthritis 0.70 per 1000 according to the present study. If the acute morbidity rates for these two ailments are added to chronic morbidity, it becomes 9.21. The KSSP study (1996) has given a chronic morbidity of 18.3 per 1000 for joint ailments. Perhaps this includes rheumatism and arthritis. Panikar (1993) has given a rate of 10.5 per 1000 for joint problems. The rate for Kerala obtained by the present study is of the same order as those obtained by KSSP (1996) and Panikar (1995). The NCAER (1993) study has estimated the all-India chronic morbidity for rheumatism and arthritis as 1.4 per 1000 for rural and 1.9 per 1000 for urban (combined estimate 1.5 per 1000). It is quite possible that climatic and geographic factors have made Keralites more prone to diseases like rheumatism and arthritis.

Chronic heart ailments, according to the present survey, have a morbidity of 6.85 per 1000. The importance of the illness in terms of burden of disease would increase very much if mortality is also taken into consideration, but the present study is restricted to morbidity. The KSSP (1996) study has given a corresponding rate of 5.98 per 1000. Panikar (1995) has reported 5.5 per 1000. The estimates appear to be of the same order.

Mental disorders account for 2.58 percent of the total chronic morbidity with a rate of 1.63 per 1000. In view of the social stigma attached to reporting it, there might have been some under-reporting. This group covers the whole range from congenital under-development of brain to schizophrenia to Alzheimer's disease. The KSPP (1996) study has given a rate of 0.92 per 1000. The NCAER (1993) study has given a prevalence rate of 0.4 for the rural and 0.8 for the urban leading to a combined figure of 0.5 per 1000 for all-India. The morbidity in Kerala due to mental diseases does seem to be high. The high rate of suicides in Kerala also

corroborates this. It would be worthwhile carrying out a study specially focused on mental diseases.

Figure.4.3 Prevalence of chronic ailments (63.53 per 1000)

☐ Diabetes (16.90)	☐ Blood pressure problems(16.56)	☐ Asthma(16.20)
☐ Rheumatism and arthritis(13.10)	☐ Heart ailments(10.81)	☐ Mental disorders
☐ Cancer(2.38)	☐ Others(21.47)	
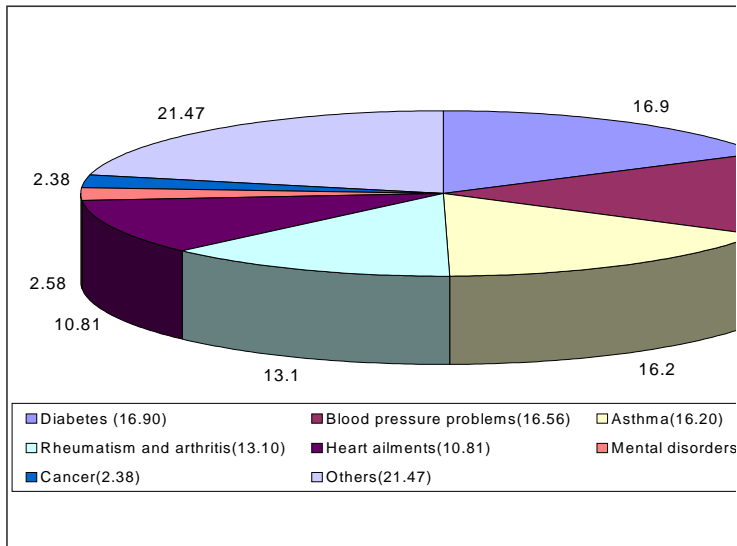
Multiple chronic ailments

There were a few cases of individuals having multiple chronic ailments. Such individuals were considered ill in respect of each of the ailments. For instance, a person having blood pressure, diabetes, and heart ailment would have been shown against all the three ailments. It would mean that the 1317 cases of chronic illness reported related in reality to a slightly smaller number of individuals.

There were 46 individuals with multiple chronic complaints. A break-up by the various combinations of multiple ailments is given in Table 4.6. The figures indicate that among the major chronic ailments, blood pressure have maximum association with other ailments.

Estimate of fresh cases of chronic ailments coming up in a year

The year of commencement was recorded for each case of chronic illness. These figures may be used to get some idea of the number of new cases occurring or detected in a year. A summary of the data available in this regard from the survey is given in Table 4.7.

The survey commenced by the middle of February 2000 and was over by February 2001, the midway point being around August 2000. The number of one-year old cases on the date of survey would be between 82 and 148, say a combination with a weight of 0.67 and 0.33. This would be 104. The number of two-year old cases would similarly be of the order of 153. The remaining 1060 cases would be more than two years old. Rise in the number of

Table 4.6 Multiple chronic ailments

	Blood pressure	Diabetes	Heart ailment	Rheumatism and arthritis	Asthma
Blood pressure	-	*13	*6	5	3
Diabetes	*13	-	*7	3	3
Heart ailment	*6	*7	-	-	1
Rheumatism and arthritis	5	3	-	-	1
Asthma	3	3	1	1	-
Others	4	1	-	3	1
Total	31	27	14	12	9
No. of cases	226	229	140	152	209
Per cent	13.72	11.79	10.00	7.89	4.31

*There were 3 cases with blood pressure, diabetes, and heart ailment.

Table 4.7 Year of commencement of chronic illness

Illness	Year of commencement						
	2000	1999	1998	1990-1997	1989 & earlier	Total	Estimated no. of new cases
Diabetes	16	23	20	123	49	231	18.31
Blood pressure	7	15	36	133	35	226	9.64
Asthma	4	11	15	105	74	209	6.31
Rheumatism	8	19	22	85	18	152	11.63
Arthritis	2	1	3	6	3	15	1.67
Heart diseases	10	17	17	76	20	140	12.31
Cancer	6	10	6	8	0	30	7.32
Mental	1	2	2	15	13	33	1.33
All	82	148	164	662	261	1317	103.78

chronic cases may be due to onset of new cases or freshly detected cases, supplemented by in-migration of chronic cases. Decrements may result from cure of ailment, death of the patient due to the particular chronic ailment or due to any other cause or out-migration of the patient.

The available data from the survey do not permit any such refined examination. The net current increment in one year is of the order of 104. If this is converted to a rate, it becomes 104 out of 1317 cases – that is 0.0790 per prevalent case. Since the prevalence rate is 63.53 per 1000, the number of additions becomes 5.02 per 1000. The age-wise distribution of the persons reporting chronic illness cases according to Appendix Table 4 is 0-14: 3.49 percent, 15–44: 18.91 percent, 45-59: 32.65 percent, and 60+: 44.95 percent. Using these and the relative proportions in the corresponding age groups according to the Census 1991 (29.71,

49.62, 11.60, and 9.07 percent) the following rates are obtained based on 1000 persons in the specific age group:

0.59 per 1000 of persons aged 0-14.
1.91 per 1000 of persons aged 15-44.
14.13 per 1000 of persons aged 45-59.
24.88 per 1000 of persons aged 60+.

The population of the State being 3, 18, 38,619 according to the Census 2001, in terms of total addition to chronic cases, a rate of 5.02 per 1000 is equivalent to 31838.619 multiplied by 5.02, which is of the order of 159830 cases per year. The main constituents of this would be diabetes: 28194 (17.64 percent), blood pressure: 14848 (9.29 percent), asthma: 9718 (6.08 percent), rheumatism and arthritis: 20490 (12.82 percent), heart ailments: 18956 (11.86 percent), cancer: 11268 (7.05 percent), and mental ailments: 2046 (1.28 percent).

Degree of severity of acute ailment

Whether treated or not

The degree of severity of illness could be considered in terms of several factors, 'whether treated or not' being one of them. The others may be 'whether the illness required hospitalisation/surgery', 'whether the illness involved incapacitation and if so to what degree and for what duration', and 'was the person unable to attend to his/her work on account of illness and if so for what duration'. Of the 3337 cases of acute illness 206 were not treated. A break-up by sex and age group of the cases not treated is given in Table 4.8.

The percentage of those who are not treated in the age group 0-4 is 3.12 whereas the corresponding figure for the age group 5 and above is 7.47. A test of significance using Chi-square shows the difference to be statistically highly significant, with a probability (P) value much less than 0.01. This indicates that cases of illness among small children are taken more seriously and is given medical attention.

Table 4.8 Number of cases not treated according to sex

| | Number of cases not treated | | | | | | | | |
| | Age 0-4 | | | Age 5 and above | | | All ages | | |
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Not treated	20	11	31	58	117	175	78	128	206
Treated	516	447	963	918	1250	2168	1434	1697	3131
Total	536	458	994	976	1367	2343	1512	1825	3337
Per cent not treated	3.73	2.40	3.12	5.94	8.56	7.47	5.16	7.01	6.17

Gender disparity in the proportion not treated is examined in Table 4.8. In the age group 0-4 there is a marginal difference between the sexes in the percent not treated. This difference is

not significant when tested using Chi-square (P=0.23). But in the age group 5 and above and in all ages together the proportion not treated appears to be more among the female sex. In both these cases the Chi-square test has yielded a significant result (P=0.018, P=0.027) suggesting that, excluding small children, there does appear to be a gender bias, though of a small magnitude, in favour of males in the matter of treating illness. The reasons for not treating are given in Appendix Table 10. The commonest reason given is that the illness was not considered serious enough. Of the 206 cases, 174 (84.47 percent) fell in this category. Lack of medical facility was the reason only in 3.40 percent and costliness of treatment was cited only in 1.94 percent of the cases.

Only cases for which a doctor or medical institution was consulted were taken as treated. Cases, which were given self-treatment or treatment based on the advice of a medical shop, were considered as untreated. Of the 206 untreated cases, the results show that some expenditure was incurred in 90 cases (43.69 percent). Obviously in these cases some treatment was given, though not based on formal medical advice.

Duration of episodes of acute ailments

The duration of episodes of acute illness within the reference period is given in Table 4.9. The average duration of an acute ailment works out as 6.35 days within the reference period.

Table 4.9 Duration of episodes of acute ailments

	Rural	**Urban**	**All**
Total duration (days)	14229	6975	21204
Number of cases	2237	1100	3337
Duration per case	6.36	6.34	6.35

Admission to hospital - acute illness

Out of the 3337 cases of acute illness, only 270 (8.09 percent) needed hospitalisation. Of the 270 admissions, 32.96 percent were to government hospital, 66.30 percent to private hospital, and 0.74 percent to others. The ailments for which a large number of cases had to be admitted were fever, bronchitis, influenza, disorders of the upper respiratory tract, diarrhoea/dysentery, and injuries. These accounted for 162 of the 270 admissions (60.00 percent). The ailments for which more than 50 percent of the affected cases were admitted were mainly disorders of the breast, disorders of the female genital tract, epilepsy, food poisoning / vomiting, hernia, appendicitis, pleurisy, and pneumonia.

Surgery - acute illness

There were 33 cases out of 3337 (0.99 percent) which involved surgery. The ailments were mainly injuries, appendicitis, disorders of the eye, disorders of the female genital tract, hernia, and piles. These accounted for 75.76 percent of the surgery cases.

Incapacitation/inability to go for work due to acute illness

The number of cases of acute illness that involved incapacitation is given in Table 4.10.

Table 4.10 Incapacitation due to acute illness

Degree of in capacitation	Number of days incapacitation						Percent
	1	2-3	4-5	6-9	10+	Total no. of cases	
Total incapacitation	10	99	98	91	95	393	11.78
Confinement to bed	7	193	171	105	119	595	17.83
Restricted physical activity	16	567	506	264	177	1530	45.85
No incapacitation	-	-	-	-	-	819	24.54
Total	33	859	775	460	391	3337	100.00

The number of acute illness cases that prevented the individual from attending to work is given in Table 4.11.

Table 4.11 Acute illness preventing from work

Number of days	Number of cases	Per cent
0	859	25.74
1	37	1.11
2 – 3	792	23.73
4 – 5	768	23.02
6 – 9	487	14.59
10 and above	394	11.81
Total number of cases	3337	100.00

An illness which was not considered to be serious enough for treatment, which did not result in incapacitation, and which did not keep the individual away from normal work may be considered to be only trivial. Of the 3337 cases, 123 fell in this category. This would imply that the burden of disease was only marginal in 3.69 percent of the cases of acute illness.

The figures in Table 4.11 give some idea of the number of days for which acute illness prevented the affected individuals from working. Appendix Table 12 gives further details. It gives for each disease the number of days for which it prevented the affected individual from work. The absence from work per episode works out to 4.18 days. A measure of the burden of disease could be the total number of person-days not worked. Since the incidence rate is 47.60 per 1000 the number of days lost becomes (4.18 x 47.60 =) 198.97 days per 1000 in a 15-day period. For one year the number of days lost by 1000 persons is 4842. Thus on an average, one person is unable to work for about 5 days in a year on account of acute illness.

The major contributors to this loss were fever non-specific (30.54 percent), diseases of upper respiratory tract (14.63 percent), influenza (6.63 percent), injuries (6.48 percent), and bronchitis (3.97 percent). Since influenza and bronchitis may be classified as respiratory diseases and because most cases of fever non-specific have some respiratory symptoms, it appears that it is the group of respiratory diseases that is responsible for more than 50 percent of the person-days lost.

Degree of severity of chronic ailment

Whether treated or not

The 1317 cases of chronic illness may similarly be categorised on the basis of severity in terms of 'whether treated or not', 'the number of days spent in hospital', 'the number of days incapacitated', and 'the number of days not worked'. Most of the cases answered affirmatively to the question 'whether taking treatment on a regular basis'. There were only 61 who were not taking treatment on a regular basis out of the 1317 cases (4.63 percent). But all of them were incurring some expenditure on treatment of the ailment.

Incapacitation/inability to go for work due to chronic ailment

There was incapacitation resulting from chronic ailments in 70.77 percent of cases as seen from Table 4.12.

Table 4.12 Incapacitation due to chronic illness

Degree of incapacitation	Number of days incapacitated during the previous 365 days					
	0	**1 – 30**	**31 – 90**	**91 – 179**	**180 – 365**	**Total**
Total incapacitation	1	42	46	18	33	140
Confinement to bed	0	38	88	14	26	166
Restricted activity	16	139	274	113	84	626
No incapacitation	385	0	0	0	0	385
Total of all categories	402	219	408	145	143	1317

Chronic ailment prevented the affected individual from attending to work in 911 out of the 1317 cases (69.17 percent). The number of days for which chronic ailments prevented the individuals from attending to their work is given in Table 4.13.

Table 4.13 Chronic illness preventing from work

Last 15 days	Number of cases
0	406
1 – 4	698
5 – 9	79
10 – 15	134
Total number of cases	1317

Last 365 days	
0	406
1 – 30	205
31 – 90	390
91 – 179	150
180 – 365	166
Total number of cases	1317

The survey shows that out of the 1317 chronic cases, there was no incapacitation in 385 cases and there was no absence from work in 406 cases. However, almost all these persons were incurring some expenditure on account of their ailments. Many of them were suffering from hypertension and diabetes and were keeping the problem in check by medication, diet control, and modifications in life style. When viewed in this way, they were not trivial cases even though there was no incapacitation or loss of working time. They too added up to the total of number of years lived with disability and to the burden of disease.

Appendix Table 13 gives the number of days for which each chronic disease prevented the affected person from attending to work. The total number of person days lost thus by 1317 cases of chronic illness is 91,491 days. The major contributors to loss of working person-days were asthma (17.99 percent), heart ailments (16.24 percent), rheumatism (12.81 percent), diabetes (10.50 percent), and blood pressure (6.92 percent). These five account for 64.46 percent. The number of persons-days lost in a year per case of chronic illness works out to 69.47 in a year. Since the prevalence rate for chronic ailments is 63.53 per 1000, the number of days lost becomes (69.47 x 63.53 =) 4413 per year per 1000 persons.

Association with age and gender – general morbidity rates

General

The distribution by religion/social group, age and sex of the population of the households from the sample wards selected for collection of detailed data is given in Appendix Table 3. The distribution by the same characteristics of the cases of acute and chronic ailment is given in Appendix Table 4. Comparison of morbidity in the different age and sex groups has been done using the corresponding composition in the population as standard. For instance, if there is higher proportion of persons of female sex among those reporting a particular ailment as compared to the population, it may be inferred that the ailment is more prevalent among the female sex. Moreover, ratios of the number of cases to the population have been worked out for ease of comparison; but the ratios thus worked out are bound to be higher than the actual morbidity rates since all the households selected for collection of detailed data have at least one person with ailment. This remark applies to the rest of this section.

Acute morbidity rates

The morbidity rate for acute illness for the age group 0-4 is 163.93 per 1000 whereas for the age group 5 and above it is 46.95 per 1000 as seen from Table 4.1 of this Section.

Having seen that the morbidity in the age group 0-4 is higher, it may be examined whether there is a sex differential within this age group. The observed number of cases of acute illness among males and females of this age group is given in Table 4.14.

Table 4.14 Number of cases of acute illness by sex in the age group 0-4

	Cases			Population	
	Number	**Per cent**	**Per cent cases to population**	**Number**	**Per cent**
Male	536	53.92	45.69	1173	52.23
Female	458	46.08	42.68	1073	47.77
Total	994	100.00	44.26	2246	100.00

The figures indicate that the relative proportion of males and females among the cases is more or less the same as in the population. The calculated value of Chi-square has a probability of 0.15 which confirms this.

A break-up of the cases of acute illness in the age groups 5 and above is given in Table 4.15, together with the corresponding number in the population.

Table 4.15 Number of cases acute illness in the age group 5 and above

	Cases			Population	
	Number	**Per cent**	**Per cent cases to population**	**Number**	**Per cent**
5 – 9	373	15.92	23.36	1597	9.35
10 – 14	297	12.68	18.38	1616	9.46
15 – 44	899	38.37	9.64	9322	54.59
45 – 59	431	18.39	17.05	2528	14.81
60 +	343	14.64	17.04	2013	11.79
Total	2343	100.00	13.74	17076	100.00

The Chi-square test calculated to test the hypothesis that the relative proportions among the cases of illness and the population are the same yields a probability, much lower than 0.01. This indicates that the relative composition of the cases of illness in the various age groups is different from that in the population. A further examination of the figures brings out that in the age group 15-44 the morbidity is much less whereas it is more in the age groups   5-9, 10-14, 45-59 and 60+.

Having seen that the younger age groups and the older age groups have contributed a more than proportional share of the cases of acute illness, it is worthwhile examining whether there is any gender disparity. For this an examination of the number of cases by sex within each age group was done. A break-up of the cases of illness by age and sex is given in Table 4.16.

Table 4.16 Acute illness by age and sex

Age	Cases of acute illness				Population	
	Male	Per cent cases to population	Female	Per cent cases to population	Male	Female
5 – 9	190	23.72	183	22.99	801	796
10 – 14	143	18.10	154	18.64	790	826
15 – 44	323	7.27	576	11.81	4444	4878
45 – 59	182	15.38	249	18.51	1183	1345
60 +	138	14.85	205	18.91	929	1084
Total	976	11.98	1367	15.31	8147	8929

The Chi-square calculated on the hypothesis that the proportion of males and females among the cases of illness within each age group is the same as in the population yields low probabilities in all the age groups except the groups of 5-9 and 10-14. The ratio of cases to population given in the table also confirms this. The results thus show that in the age group 15-44 and to a lesser extent in the age groups 45-59 and 60+ males have a lower morbidity as compared to females.

The distribution of the cases of acute illness among males only is given in Table 4.17.

Table 4.17 Acute illness among males by age

Age	Cases among males			Population	
	Number	Per cent	Per cent cases to population	Number	Percent
5 – 9	190	19.47	23.72	801	9.83
10 – 14	143	14.65	18.10	790	9.70
15 – 44	323	33.09	7.27	4444	54.55
45 – 59	182	18.65	15.38	1183	14.52
60 +	138	14.14	14.85	929	11.40
Total	976	100.00	11.98	8147	100.00

It appears from a comparison of the relative composition that the morbidity among males in the age group 15-44 is lower as compared to the other age groups. Chi-square calculated on the hypothesis that the relative proportions by age among the cases of illness and the population are the same yields a probability much less than 0.01, which confirms that there is a difference. An examination of the ratio of cases to population shown in the Table confirms that morbidity prevalence among males is lower in the age group 15-44.

Here also the Chi-square has a probability much less than 0.01, which indicates that age composition of the cases is different from that of the population. The ratio of cases to population within each age group shown in the Table confirms that morbidity among females is lower in the age group 15-44.

The corresponding figures for females are given in Table 4.18.

Table 4.18 Acute illness among females by age groups

Age	Cases among females			Population	
	Number	**Per cent**	**Per cent cases to population**	**Number**	**Percent**
5 – 9	183	13.39	22.99	796	8.92
10 – 14	154	11.27	18.64	826	9.25
15 – 44	576	42.13	11.81	4878	54.63
45 – 59	249	18.21	18.51	1345	15.06
60 +	205	15.00	18.91	1084	12.14
Total	1367	100.00	15.31	8929	100.00

Chronic illness

In the case of chronic illness, the distribution of the cases in the various age groups is given in Table 4.19.

Table 4.19 Chronic illness by age

Chronic illness cases by age and sex	Cases			Population	
	Number	**Per cent**	**Per cent cases to population**	**Number**	**Percent**
0 – 14	46	3.49	0.84	5459	28.25
15 – 44	249	18.91	2.67	9322	48.25
45 – 59	430	32.65	17.01	2528	13.08
60 +	592	44.95	29.41	2013	10.42
Total	1317	100.00	6.82	19322	100.00

The figures indicate that the percentage composition of the cases is very much different from that of the population. This is confirmed by a Chi-square test which yields a probability of almost zero. The per cent cases to population shown in the table also brings out that in the age groups 45-59 and 60+ the morbidity is very much higher than in the age groups 0-14 and 15-44.

Having seen that chronic illness is relatively more in the age groups 45-59 and 60+ it is worth examining whether there is any gender differential. The break-up of cases of chronic illness by sex is given in Table 4.20.

A Chi-square test carried out yields a probability less than 0.01 indicating that the male-female composition of the chronic cases is different from the male-female composition of the population. The ratio of cases to population within each age group shown in the Table also brings out that in the age group 15-44 chronic morbidity is more among females as compared to males.

Table 4.20 Chronic illness by sex and age

Chronic illness cases by age and sex	Chronic cases				Population	
	Male	Per cent cases to population	Female	Per cent cases to population	Male	Female
0 – 14	26	0.94	20	0.74	2764	2695
15 – 44	94	2.12	155	3.18	4444	4878
45 – 59	191	16.15	239	17.77	1183	1345
60 +	270	29.06	322	29.70	929	1084
Total	581	6.23	736	7.36	9320	10002

Considering chronic cases among males only, the break-up by age is given in Table 4.21.

Table 4.21 Chronic cases among males by age

Chronic illness cases by age and sex	Cases among males			Population	
	Number	Per cent	Per cent cases to population	Number	Percent
0 – 14	26	4.48	0.94	2764	29.63
15 – 44	94	16.18	2.12	4444	47.68
45 – 59	191	32.87	16.15	1183	12.69
60 +	270	46.47	29.06	929	9.97
Total	581	100.00	6.23	9320	100.00

Chi-square calculated to test whether the age composition of the cases is the same as that of the population yields a probability of almost zero, indicating that it is not so. Examination of the per cent cases to population brings out that in the age group 60+ and to a lesser extent in the age group 45-59 the chronic morbidity is very much higher than in the lower age groups. A similar examination of the chronic cases among females was done from the figures in Table 4. 22.

Table 4.22 Chronic cases among females by age

Chronic illness cases by age and sex	Cases among males			Population	
	Number	Per cent	Per cent cases to population	Number	Percent
0 – 14	20	2.72	0.74	2695	26.94
15 – 44	155	21.06	3.18	4878	48.77
45 – 59	239	32.47	17.77	1345	13.45
60 +	322	43.75	29.70	1084	10.84
Total	736	100.00	7.36	10002	100.00

Chi-square calculated to test whether the age composition of the cases is the same as that of the population yields a probability nearly zero indicating that it is not so. An examination of the per cent cases to population given in the Table shows that chronic morbidity is higher in the age group 60+ and to a lesser extent in the age group 45-59.

Morbidity rates by age and sex

The results thus show that acute morbidity is higher in the lower age group of 0-14, 45-59 and 60+ and that chronic morbidity is higher in the age group 60+ and to a lesser extent in the age group 45-59. There is a sex differential within the age 15-44, females tending to have a higher morbidity, both acute as well as chronic. The estimated morbidity rates for the age groups by sex are given below. They have been derived from the overall morbidity rates given in Table 4.1 and the relative proportions among the cases and among the population given in Appendix Tables 3 and 4.

Table 4.23 Morbidity prevalence rates per 1000 by age and sex

Ages	Acute			Chronic		
	Male	**Female**	**All**	**Male**	**Female**	**All**
0 – 4	169.26	158.11	163.93	8.77	6.74	7.85
5 – 9	81.17	78.67	79.92			
10 – 14	61.94	63.80	62.89			
15 – 44	24.87	40.40	33.00	19.72	32.51	24.90
45 – 59	52.64	63.35	58.34	150.49	188.30	158.54
60 +	50.83	93.12	58.30	270.89	323.06	274.11
All ages	54.15	60.91	57.65	58.10	73.60	63.53

Association with age and gender – morbidity for main acute ailments

A break-up of the acute illness cases by disease, age, and sex is given in Appendix Table 15. An examination of the figures in Appendix Table 15 gives some idea of the association of acute morbidity with age and gender.

The acute morbidity prevalence for the combined group of water-borne infections, respiratory diseases, and fever non-specific was examined for association with age. The distribution of the cases by age is given below.

Chi-square calculated to test whether the age composition of the cases is the same as that of the population yields a probability of almost zero. An examination of the figures brings out clearly that in the age group 0-4 and to a lesser extent in the age group 5-14 the morbidity is very much higher than in the other age groups. It is lowest in the age group 15-44 and somewhat higher in the age groups 45-59 and 60+.

A break-up by sex is given in Table 4. 25.

Table 4.24 Water-borne infections, respiratory diseases, and fever by age

Age	Cases			Population	
	Number	**Per cent**	**Per cent cases to population**	**Number**	**Percent**
0 – 4	910	37.36	40.52	2246	11.62
5 – 14	540	22.17	16.81	3213	16.63
15 – 44	584	23.97	6.26	9322	48.25
45 – 59	231	9.48	9.14	2528	13.08
60 +	171	7.02	8.49	2013	10.42
All ages	2436	100.00	12.61	19322	100.00

Table 4.25 Water-borne infections, respiratory diseases, and fever by sex

Age	Cases						
	M	**Per cent**	**Per cent cases to population**	**F**	**Per cent**	**Per cent cases to population**	**M**
0 – 4	489	42.93	41.69	421	32.46	39.24	1173
5 – 14	264	23.18	16.59	276	21.28	17.02	1591
15 – 44	201	17.65	4.52	383	29.53	7.85	4444
45 – 59	115	10.10	9.72	116	8.94	8.62	1183
60 +	70	6.12	7.53	101	7.79	9.32	929
All	1139	100.00	12.22	1297	100.00	12.97	9320

An examination of the morbidity prevalence among the age groups among males separately brings out that the age composition of males among the cases is different from that of males of the population, the probability of Chi-square being much less than 0.01. For females also the position is the same. In the age groups 0-4 and 10-14, the number of cases is more than proportional and correspondingly in the other age groups the number of cases is less than proportional. The ratio of cases to population given in the Table also brings out that the morbidity for this group of ailments is higher in the age groups 0-4 and 5-14, both among males and among females.

The relative morbidity among the sexes in each age group was examined from Table 4.26.

A test within each age group brings out that in the age group 15-44 there is a significant difference, the number of cases among females being more than proportional. The percentage of cases to population given in Table 4.25 for the two sexes also brings out that within the age group 15- 44 the morbidity for this group of ailments is higher among the female sex.

Association with age and gender – morbidity for main chronic ailments

For the chronic ailment of diabetes, the age-wise distribution is given in Table 4.27.

Table 4.26 Water-borne infections, respiratory diseases, and fever – sex composition within the age groups

Age	Cases		Population	
	Per cent male	**Per cent female**	**Per cent male**	**Per cent female**
0 - 4	53.74	46.26	52.23	47.77
5-14	48.89	51.11	49.52	50.48
15 - 44	34.42	65.58	47.67	52.33
45 - 59	49.78	50.22	46.80	53.20
60 +	40.94	59.06	46.15	53.85

Table 4.27 Chronic diabetes cases by age

Age	Cases			Population	
	Number	**Per cent**	**Per cent cases to population**	**Number**	**Percent**
0 – 14	1	0.43	0.02	5459	28.25
15 – 44	16	6.93	0.17	9322	48.25
45 – 59	86	37.23	3.40	2528	13.08
60 +	128	55.41	6.36	2013	10.42
All ages	231	100.00	1.20	19322	100.00

The Chi-square calculated to test whether the age composition of the cases is the same as that of the population yields a probability of much less than 0.01 indicating that the age composition is not the same. The ratio of cases to population shown in the Table brings out that the prevalence of diabetes is higher in the age groups 45-59 and 60+.

A separate examination was made of the morbidity for diabetes among males and females. The results are given in Table 4.28.

Table 4.28 Chronic diabetes cases by age and sex

Age	Cases							
	Male	**Per cent**	**Per cent cases to population**	**Female**	**Per cent**	**Per cent cases to population**	**Male**
0 – 14	0	0	0	1	0.85	0.04	2764
15 – 44	8	7.02	0.18	8	6.84	0.16	4444
45 – 59	42	36.84	3.55	44	37.61	3.27	1183
60 +	64	56.14	6.89	64	54.70	5.90	929
All ages	114	100.00	1.22	117	100.0	1.17	9320

Here again tests indicated that the morbidity is less in the age groups 0-14 and 15-44 and more in the age groups 45-59 and 60+ both among males and females.

To see whether a sex differential exists, tests were carried out within each of the age groups 15-44, 45-59, and 60+. The results showed that the proportion of males and females among the cases is the same as in the population. This is confirmed by an inspection of the ratio of cases to population for each sex within each age group.

The prevalence of the other important chronic disease groups was examined in the same way from the figures given in Table 4.29.

Table 4.29 Chronic blood pressure, asthma, heart ailments, rheumatism, and arthritis by age and sex

Age	Blood pressure			Asthma			Heart ailments			Rheumatism and arthritis		
	M	F	Total	M	F	Total	M	F	Total	M	F	Total
0 – 14	-	-	-	7	3	10	0	1	1	1	1	2
15 – 44	5	13	18	11	26	37	15	13	28	4	16	20
45 – 59	33	52	85	28	36	64	33	13	46	14	42	56
60 +	33	90	123	53	45	98	44	21	65	31	58	89
Total	71	155	226	99	110	209	92	48	140	50	117	167

Blood pressure

In the case of blood pressure, an association was found with age both among males and females, the prevalence being higher in the age groups 45-59 and 60+. There is no evidence of sex differential except in the age group 60+ where the prevalence among females is more.

Asthma

The prevalence of asthma is relatively high in the age groups 45-59 and 60+ for males as well as females. There is indication in the data that in the age group 15-44 the prevalence among females is more than among males (Chi-square probability 0.03).

Heart ailments

The prevalence is more among males as well as females in the age groups 45-59 and 60+. In the age groups 45-59 and 60+ there is evidence of a sex differential, the prevalence being more among males.

Rheumatism and arthritis

The prevalence is more in the age groups 45-59 and 60+. The test results give an indication that the prevalence is in general more among females than among males.

The prevalence rates for the main chronic ailments for each age group estimated from the age distribution of the cases (Appendix Table 16), age distribution of the population of the households selected for collection of detailed data (Appendix Table 3), and the morbidity rates for all ages for chronic ailments (Appendix Table 8) are given in Table 4.30.

Table 4.30 Morbidity by age for specific chronic ailments

Age	Morbidity rate per 1000				
	Diabetes	**Blood pressure**	**Asthma**	**Heart ailments**	**Rheumatism and arthritis**
0 –14	0.17	0	1.74	0.17	0.35
15 – 44	1.55	1.75	3.76	2.84	2.05
45 – 59	30.79	30.47	23.99	17.20	21.20
60 +	57.55	55.37	46.13	30.53	42.30
All ages	10.82	10.60	10.25	6.85	8.27

Association of morbidity with household size

The examination of illness data gave the impression that the number of cases reported from a household does not generally increase proportionally when the household size increases. A detailed examination of the number of cases reported from each of the 3840 households was made to test whether the impression was right. While each of these households had, by virtue of the selection process adopted, at least one case of illness acute or chronic, the number of additional persons reported ill was viewed against the additional persons available for each household size. The results are given in Table 4.31.

Table 4.31 Household size and ailments reported

House hold size	No.of house holds	Total no. of persons	Total number ill	Additional persons ill beyond 1 per household	Additional persons exposed to the risk beyond 1 per household	Per cent additional ill to additional exposed
1 – 4	1852	6413	2129	277	4561	6.07
5 – 8	1715	9974	2026	311	8259	3.77
9 +	273	2935	347	74	2662	2.78
All	3840	19322	4502	662	15482	4.28

The figures in Table 4.31 strengthen the impression that the number of cases reported does not increase proportionally to household size.

This was investigated in a different way from the data. For each of the 20 households of the 192 sample wards selected for collecting detailed data regarding illness, the household size is

available apart from the number of persons with ailments (Appendix Table 27). The correlation between the average household size for the sample and the proportion of persons ill (acute and chronic separately) was worked out. The figures gave a negative correlation of – 0.6663 for acute and 0.2036 for chronic. The regression was highly significant when tested by analysis of variance thus indicating that as household size increases the perceived morbidity rate tends to decrease.

Association of morbidity with education

The data available were also examined for possible association of educational level with morbidity. The educational level of each individual of the households had been recorded, the code number corresponding roughly to the number of years of education. Adding together the educational code of all individuals (of the selected households of each of the 192 wards) of 15 years and above age and dividing by the corresponding number of individuals gave an index of educational level for the ward. (Codes 21 and 22 corresponding to diplomas were treated as code 14 for this purpose.) Thus for each of the 192 samples of the morbidity study the educational index as defined above was worked out. They are also given in Appendix Table 27. The correlation between the ratio of cases to population and the educational index of the sample ward was worked out. The correlation coefficient came to +0.3005 for acute ailments and +0.2183 for chronic ailments. Both were highly significant when tested by analysis of variance. The data thus indicate a positive association between educational index of a locality and the morbidity rate implying that with increase in educational level the perceived morbidity tends to increase.

Association with economic level

The average per capita income for each of the 192 sample wards was calculated from the data collected from the 20 households of each ward. It is quite possible that income is often understated. But it may be assumed that the understatement is uniform. Appendix Table 27 gives the average per capita income worked out for each ward. The average monthly per capita expenditure (MPCE) worked out for each ward is also given in Appendix Table 27. (The monthly expenditure incurred for each item by each household had been recorded. Hence the total expenditure could be worked out and hence the MPCE.) The correlation coefficient of average per capita income with morbidity was +0.1456 for acute ailments, which when tested by analysis of variance came out as significant. The correlation coefficient was +0.2583 for chronic ailments, which came out as highly significant. The correlation of MPCE with acute morbidity came to +0.0590 (not significant when tested by analysis of variance) and +0.3053 with chronic morbidity (highly significant). Thus the overall picture is that there is a positive association between morbidity and economic level.

Association with religion/social group

The composition of the 3337 cases of acute illness and the 1317 cases of chronic illness by religion and by social groups is given in Appendix Table 4. To examine whether there is any association of morbidity with religion or social group, a comparison may be made with the composition of the population of the households from which the detailed morbidity data had

been collected, given in Appendix Table 3. The relative distributions among the religions of the 3337 cases of acute ailments, the 1317 cases of chronic ailments and of the total population of the sample households from which the detailed data were collected are given in Table 4.32.

Table 4.32 Distribution by religion of the population and cases of ailments

Religion	Acute illness			Chronic illness		
	Number	Per cent	Per cent cases to population	Number	Per cent	Per cent cases to population
Hindu	2006	60.11	17.96	785	59.60	7.03
Christian	632	18.94	20.22	236	17.92	7.55
Muslim	695	20.83	13.89	296	22.48	5.92
Others	4	0.12	17.39	-	-	-
Total	3337	100.00	17.27	1317	100.00	6.82

The figures suggest that as regards acute illness the number of cases among Muslims is less than proportional to their strength. A statistical test was done to test the hypothesis that the number of cases in each religion is proportional to their number in the population. The value of Chi-square obtained has a probability less than 0.01 confirming that the number of cases among Muslims is less than proportional to their population. A similar examination was made of the figures for chronic ailments among the religions. Here also the number of cases among Muslims is less than proportional, but to a lesser degree. The value of chi-square obtained in this case came out as significant, the probability being 0.01.

It was also examined whether the lower morbidity rates for Muslims could be due to the difference in age composition. For this the ratio of cases to population was calculated for each age group using the relative composition of the cases (Appendix Table 4) and of the population (Appendix Table 3). The results given in Table 4.33 confirmed the lower morbidity among Muslims for acute ailments since within each age group the ratio of cases to population is lower for Muslims. As regards prevalence of chronic ailments, the ratio of cases to population within the age groups does not show a lower figure for Muslims even though considering all age groups together the ratio is lower for Muslims. Thus the data do indicate that Muslims have a lower morbidity for acute ailments though it cannot be said so for chronic ailments.

An examination of the morbidity figures was also made on the basis of social groups within Hindus. A break-up of the cases by social groups among Hindus is given in Table 4.34.

Regarding acute illness there does not appear to be any substantial difference among the communities, considering the composition of each social group in the 192 samples taken up for detailed evaluation. The value of Chi-square calculated has a probability of 0.08, which is not significant and hence does not indicate that there is inter-group disparity. But when chronic cases are considered, it appears that substantial inter-group disparity exists when

Table 4.33 Ratio of cases to population by religion/social groups within age groups

Age	Ratio per cent			
	Acute ailments			
	Hindu	**Christian**	**Muslim**	**All**
0 – 4	48.39	51.30	32.62	44.26
5 – 14	22.30	27.59	15.99	20.88
15 – 44	9.91	11.21	8.07	9.64
45 – 59	16.93	22.17	13.27	17.05
60 +	18.25	16.33	12.72	16.99
All	17.96	20.22	13.89	17.27
Within Hindu	Acute ailments			
	SC	**ST**	**HB**	**HF**
0 –4	49.77	46.81	46.82	51.37
5 –14	25.00	10.26	22.29	23.10
15 –44	11.84	11.35	9.52	9.26
45 – 59	19.41	18.46	16.75	15.70
60 +	19.35	18.92	17.89	18.39
All	20.06	16.45	17.54	17.82

Table 4.34 Number of cases of illness by social groups within Hindus

Social groups	Number o		Per cent cases to population
	Acute		
	Number	**Per cent**	
Scheduled Castes	347	17.30	20.06
Scheduled Tribes	75	3.74	16.45
Hindu Backward	1081	53.89	17.54
Hindu Forward	503	25.07	17.82
Total	2006	100.00	17.96

viewed against the relative composition by social group. The value of Chi-square calculated on the assumption of homogeneity has a probability much less than 0.01 indicating significant variation among the social groups. An examination of the percentage of chronically ill among the various age groups within the social groups against the relative age composition in the population indicated that Hindu Forward castes have a higher morbidity. A further examination of the ratio of cases to population within each age group for each of the social groups of Hindus confirmed that Hindu Forward have a higher morbidity for chronic ailments as compared to the other social groups. The ratio of chronic cases to population came to 18.94 percent for Hindu Forward as against 16.23 for all Hindus together in the age group 45-59 and 35.01 percent for Hindu Forward castes as against 28.78 for all Hindus together in the age group 60+.

A break-up of the cases within the Christian social groups is given in Table 4.35.

Table 4.35 Number of cases of illness by social groups among Christians

| Social groups | Number of cases | | | | | |
| | Acute | | | Chronic | | |
	Number	Per cent	Per cent cases to population	Number	Per cent	Per cent cases to population
Scheduled Tribes	2	31.01	20.76	-	26.69	6.
Christian Backward	194			63		
Others	436	68.99	20.00	173	73.31	7.
Total	632	100.00	20.22	236	100.00	7.

The Chi-square value for acute illness has a probability as large as 0.62. As regards chronic cases, the probability of Chi-square is 0.22. The figures thus do not indicate any difference among the social groups of Christians in morbidity prevalence, acute or chronic.

Table 4.36 details the estimated morbidity prevalence rates for the various religious/social groups. The rates have been derived from the overall morbidity prevalence rate given in Table 4.1 and the relative proportions among the cases of illness and among the total population of the households (Appendix Tables 3 and 4). Both acute morbidity and chronic morbidity appear to be less among Muslims as compared to Hindus and Christians. As regards social groups within Hindus, Hindu Forward castes have a higher chronic morbidity.

It was seen that the morbidity for acute ailments is less among Muslims as compared to other religious groups even after allowing for difference in age composition. One possible reason could be the larger household size among Muslims. The distribution of the households

Table 4.36 Morbidity rate by religion/social group

Religion	Social group	Acute	Chronic
Hindu	Scheduled Castes	66.95	43.64
	Scheduled Tribes	54.90	69.50
	Hindu Backward	58.55	60.95
	Hindu Forward	59.48	88.15
	Total	59.94	65.49
Christian	Christian Backward	69.31	62.20
	Christian others	66.73	73.93
	Christian Total	67.51	70.39
Muslims	46.38	55.16	
Total	57.65	63.53	

of the 192 samples by household size, religion, and social group is given in Appendix Table 17. As may be seen from this Table the average household size of Muslims is 6.18 whereas it is 4.79 for Hindus and 4.50 for Christians. The household size of the various social groups of Hindus and Christians also ranged between 4.5 and 5. Similarly 50.44 percent of Muslims belonged to households of size 7 or more whereas the corresponding figures is 24.79 percent for Hindus, 14.94 percent for Christians and 29.88 percent for all combined. It was earlier pointed out that acute morbidity is negatively associated with household size. The lower morbidity for acute ailments among Muslims falls in line with this finding.

Another possible reason for the low acute morbidity among Muslims could be the educational level. As have been stated earlier, a positive association exists between morbidity and educational level. The educational index was worked out for the various religious and social groups and is given in Table 4.37.

Table 4.37 Educational index by religion and social group

Religion/Social group		Educational index
	Scheduled Castes	6.41
	Scheduled Tribes	3.91
	Hindu Backward	7.79
	Hindu Forward	9.30
Hindu Total		7.81
	Christian Backward	8.34
	Others	9.42
Christian Total		9.08
Muslim		6.69
Total		7.76

The educational index for Muslims is lower than that of Hindus and Christians. The lower

morbidity for acute ailments among Muslims is thus in agreement with the indication that morbidity (obviously 'perceived' morbidity) increases with educational level.

There is indication that morbidity has a positive association with economic level. The average per capita monthly income and the per capita monthly expenditure for the religions/social groups as worked out from the data is given in Table 4.38.

Table 4.38 Per capita monthly income by religion and social group

Religion/ Social group		Per capita monthly income (Rs.).	Monthly per capita expenditure
	Scheduled Castes	658	589
	Scheduled Tribes	600	503
	Hindu Backward	815	652
	Hindu Forward	1083	797
Hindu Total		849	673
	Christian Backward	959	782
	Others	1015	769
Christian Total		998	773
Muslim		711	596
Total		837	669

Muslims have per capita income and per capita expenditure lower than that of Hindus and Christians, which is in conformity with association of income with morbidity. The high morbidity for chronic ailments among Hindu Forward and Christians also is in agreement with the positive association between economic level and morbidity.

Association of morbidity rates with land sector

General

In order to examine the differences in morbidity rates among the land sectors given in Table 4.1, the average educational index, the average monthly per capita income, the average per capita expenditure, and the average household size were worked out for the samples belonging to each of the sectors and are given in Table 4.39. In addition, the density of population for each sector has been worked out using Census 1991 data for population and Land Use Commission data for area, and is also given in Table 4.39. (For highland, the forest area was left out while working out the density.)

Acute morbidity rates in different sectors

An examination of the acute morbidity figures given in Table 4.1 shows that within the rural, the rate is higher in the lowland (68.21) as compared to the highland (54.49) and the midland (54.63). An important contributing reason for the higher rate of acute morbidity in the

Table 4.39 Average household size, educational index, and per capita income/ expenditure

	House-hold size	Educat-ional index	Monthly per capita income	Monthly per capita expenditure	Density of population persons/sq.km.
Rural HL	4.81	6.37	778.47	641.96	516
Rural LL	5.01	7.68	758.53	648.47	2042
Rural ML	5.12	7.29	778.04	658.13	1043
Rural	5.04	7.21	774.15	653.39	603
Urban	5.01	8.95	1133.95	842.83	2282

lowland could be the higher density of population. Living in crowded conditions would tend to increase the prevalence of sickness. Further, in such localities, the sources for health facilities (like PHC) would be available within short distances which in turn would lead to higher 'perception' and better medical attention and thereby increase the morbidity rate as reported. The higher educational index in the lowland as compared to the highland and the midland also could have contributed to better health awareness. Between the rural rate (57.35) and the urban rate (58.53) there is only a marginal difference. The factors that could have contributed to higher urban morbidity awareness such as the higher educational index and the higher economic level appear to have been compensated by lower intrinsic acute morbidity due to better health care by rural households.

Chronic morbidity rates in different sectors

The morbidity rate for chronic ailments in urban areas (68.73) is higher than the rural rate (61.71). The morbidity rates for rural and urban sectors for the main chronic ailments as obtained from the study (Appendix Table 8) are given in Table 4.40. For diabetes and blood pressure the morbidity is substantially higher in urban areas, the difference being statistically significant.

Table 4.40 Prevalence rates by sector for chronic ailments

	Morbidity rate per 1000		
	Rural	Urban	All
Diabetes	9.46	14.69	10.82
Blood pressure	9.31	14.26	10.60
Asthma	10.49	9.55	10.25
Heart ailments	6.95	6.56	6.85
Rheumatism and arthritis	8.72	6.99	8.27

The rural-urban difference noticed in the case of diabetes and blood pressure was investigated further in the light of the age structure of the rural and urban populations given in Appendix Table 21 and the age composition of the persons with specific chronic ailments

given in Appendix Table 23. The results indicated that the relative age structure does not offer a satisfactory explanation for the observed higher morbidity in urban areas for diabetes and for blood pressure. Within each age group the ratio of such cases to population is higher in urban areas. The inference thus is that diabetes and blood pressure are more prevalent in urban areas.

Seasonality

The morbidity rates were also worked out for the rural and urban sectors on a 'sub-round' basis for acute illness. The periods corresponding to the four sub-rounds of the survey were 15 February-15 May 2000, 15 May-15 August 2000, 15 August-15 November 2000, and 15 November 2000-15 February 2001. The rates obtained are given in Table 4.41. The basic data for calculation of these rates are given in Appendix Table 2.

Table 4.41   Morbidity rates by season

Sector	Season – 3	Morbidity rates per 1000 of the total population months from		
		Age 0 – 4	Age 5 +	All ages
Rural	15 February 00	16.59	38.08	54.67
	15 May 00	17.69	52.69	70.34
	15 August 00	12.99	42.16	55.14
	15 November 00	13.14	35.32	48.46
		Age 0 – 4	Age 5 +	All ages
Urban	15 February 00	13.73	40.50	54.23
	15 May 00	15.13	49.86	64.99
	15August 00	16.25	44.65	60.89
	15 November 00	13.26	40.45	53.71
State	15 February 00	15.85	38.71	54.56
	15 May 2000	17.03	51.95	68.98
	15 August 00	13.84	42.80	56.64
	15 November 00	13.17	36.65	49.83

A higher morbidity is seen in the second sub-round, which corresponds to 15 May-15 August 2000, both in the rural and the urban sectors. This difference turned out to be statistically significant. The reason could be more attacks of respiratory diseases and fever unspecified during the peak monsoon months. To verify this, the number of cases of these two diseases together in each of the sub-rounds was compared to the population from which the detailed data were collected. The results, shown in Table 4.42, confirm this. During sub-round 4 and perhaps part of sub-round 1, the acute morbidity is less, possibly because the dry and relatively cold season is not conducive to the multiplication of disease-causing organisms.

Table 4.42 Respiratory diseases and fever by season

Season – 3from months	Number of cases of acute ailments	Number of cases of respiratory diseases and fever	Population	Per cent cases to population
15 Feb 2000-	804	531	4836	10.98
15 May 2000-	891	656	4864	13.49
15 August 2000	864	599	4926	12.16
15 November 00	778	517	4696	11.01
Total	3337	2303	19322	11.92

As far as chronic ailments are concerned, there should be no seasonal effect since the reference period is one year. The number of persons who suffered from a chronic ailment any time during the previous one year was to be reported and recorded. Appendix Table 2, however, shows higher figures for chronic ailments during the first sub-round. One possible reason could be that some chronic ailments could have shown up during the relatively colder season which corresponds to sub-round 4 and after being active for some time got cured or lay dormant. Such cases would have been reported, and rightly too, by the respondent as chronic in sub-round 1. To investigate this possibility the distribution of the important chronic ailments over the sub-rounds as given in Table 4.43 was examined. It does appear that ailments such as asthma, arthritis, blood pressure, and heart problems had in fact appeared in larger numbers in sub-rounds 4 and 1 and could have possibly contributed to the apparently higher chronic morbidity in sub-round 1.

Table 4.43 Distribution of important chronic ailments over the rounds

Sub-round	Diabetes	Asthma	Rheum-atism	Arthritis	Blood pressure	Heart problems
1	55	63	37	6	65	39
2	76	41	42	1	53	29
3	51	44	39	3	48	30
4	49	61	34	5	60	42
All	231	209	152	15	226	140

System of medicine

The system of medicine resorted to – allopathy, ayurveda, homoeopathy, a combination of two or more of the three, or others – for each of the treated cases of illness is given in Table 4.44.

These figures show that allopathy is by far the most popular system both for acute and chronic illnesses. Chi-square to test whether the distribution among the systems of medicine is the same in acute illness and chronic illness yields a probability much less than 0.01

Table 4.44 Illness by system of treatment

	Acute illness	Per cent	Chronic illness	Per cent
Allopathy	2724	87.00	1101	83.60
Ayurveda	117	3.74	109	8.28
Homoeopathy	265	8.46	31	2.35
Combinations	12	0.38	68	5.16
Others	13	0.42	8	0.61
Total treated	3131	100.00	1317	100.00

implying that there is a difference in pattern. A larger proportion among chronic illness cases opt for ayurveda and combinations than among acute illness cases.

An examination of the nature of illness for which systems other than allopathy were resorted to is possible from Appendix Table 18 relating to treatment of acute illness and Appendix Table 19 relating to treatment of chronic illness. As regards acute illness, of 117 episodes treated by ayurveda, 22 (18.80 percent) were rheumatism and 20 (17.09 percent) were ailments not listed elsewhere (mainly pain in some part of the body). Of the 265 cases treated by homoeopathy, 101 (38.11 percent) were fever non-specific and 96 (36.23 percent) were diseases of the upper respiratory tract. Among chronic diseases the main favourite for ayurveda treatment was for rheumatism with 61 of the 109 cases (55.96 percent). Of the 68 cases which employed combinations of systems too, rheumatism contributed the bulk of 41.18 percent. Even for rheumatism, for which ayurveda is traditionally considered to be more effective, 37.50 percent of the cases went in for allopathy on an exclusive basis.

The proportion of cases treated by different systems for some specific ailments may be seen from Table 4.45.

Table 4.45 Main ailments treated by various systems

	Illness	Total no. of cases	Numbe		
			Allo-pathy	Ayur veda	Hom pat
Acute	Fever non-specific	1225	1031	14	
	Diseases of upper respiratory tract	692	508	13	
	Influenza	245	196	6	
	Rheumatism	45	21	22	
	Arthritis	9	5	4	
	Ailments not classified elsewhere	104	71	20	
Chronic	Rheumatism	152	57	61	
	Arthritis	15	5	8	
	Asthma	209	180	6	
	Diabetes	231	215	6	
	Blood pressure	226	208	5	

An examination of the figures given above indicates that for the chronic group rheumatism and arthritis, out of 167 cases, 69 (41.32 percent) have opted for ayurveda, 7 (4.19 percent) for homeopathy and 29 (17.36 percent) for combination. For rheumatism/arthritis as acute illnesses, out of 54 cases, 26 have opted for ayurveda and 1 for combination. Thus rheumatism/arthritis is a disease group for which more than 50 percent of the cases opted for a system other than allopathy, mainly ayurveda.

Source of treatment

Appendix Table 21gives the source of treatment for acute illness of the 3131 treated cases. Considering all the government sources together, the position is as given in Table 4.46.

Table 4.46 Source of treatment for acute illness

Rural	Urban		Total			
	Number	Per cent	Number	Per cent	Number	Per cent
Government	762	36.39	307	29.60	1069	34.14
Private	1308	62.46	710	68.47	2018	64.45
Others	24	1.15	20	1.93	44	1.41
All	2094	100.00	1037	100.00	3131	100.00

It appears from the Table that a larger proportion of persons resorted to private sources of treatment in the urban localities as compared to the rural. The difference is statistically significant. The reasons may be the availability of more private sources of treatment and the financial capacity to pay for it in urban areas. According to the KSSP study (1996) 28 percent of the treatment of acute ailments was from government sources as against 34 percent from the present study; the two estimates are of the same order.

Of the 3131 treated cases of acute illness, only 57 (1.82 percent) had taken the treatment from PHC/CHC/ANM/LHV. Within the rural areas of 2094 cases of acute illness only 50 cases (2.39 percent) had utilised PHC/CHC/ANM/LHV. It does appear that the facilities of the PHC system continue to be grossly under-utilised. This has been pointed out in earlier studies also. Sanyal had brought out, using NSSO's 1986-'87 data and NCAER's 1990 data, that the PHCs had failed to make any noticeable impact on the utilisation level in the rural scene in most States including Kerala. KSSP (1996) had analysed the reasons given by respondents for non-utilisation of PHC facilities. In the present study the distance of the nearest PHC, CHC, Government hospital and private hospital from the sample wards was recorded and may be seen in Table 4.47. Of the 128 sample rural wards there was a PHC within the ward or within 2 km of the ward in 39.06 percent. In 28.90 percent of the wards there was a PHC within 2 to 5 km of the ward. So distance could not have been the reason. Of course government and private hospitals – allopathic, ayurvedic, and homoeopathic – were also available within reasonable distance. Why the households did not prefer PHC in spite of the lower cost involved needs to be studied seriously and followed up with necessary correctives.

The reason could be deficiencies in staff or in provision of services. Or it could be that the PHCs are seen as institutions meant for preventive health services only and not as centres where treatment could be sought for illnesses.

Table 4.47 Distance of medical facility from the sample wards

	Within the ward		< 2 km		2 - 5 km	
	Rural	Urban	Rural	Urban	Rural	Urba
PHC	10	7	40	28	37	18
CHC	4	4	20	19	32	23
PHSC	26	9	46	26	38	20
Govt. Hospital						
Allopathic	3	5	29	30	46	22
Ayurvedic	2	4	22	25	44	21
Homoeopathic	7	6	20	21	39	20
Pvt. Hospital						
Allopathic	18	21	32	27	42	14
Ayurvedic	12	12	26	21	33	17
Homoeopathic	19	18	23	21	31	12

Cost of treatment

Acute illness

The cost of treatment recorded was comprehensive and included all items such as payment to hospital, payment to doctor/staff and cost of medicines, blood, laboratory examinations, X ray, scanning, special health foods, and transport for patient/accompanying member. For chronic ailments the cost of treatment was recorded for the previous month and for the previous year.

The average cost of treatment of acute illness obtained from the results is given in Table 4.48.

Table 4.48 Cost of treatment by system of medicine – Acute illness

System of medicine	Number of cases		Total cost of treatment Rs.			
	Hospit-alised	Not hospi-talised	Hospi-talised	Not hospita-lised	Total	
Not treated	-	206	-	4112	4112	
Allopathy	264	2460	442723	513403	956126	
Ayurveda	3	114	13590	36317	49907	
Homoeopathy	1	264	445	20141	20586	
Combinations	-	12	-	4781	4781	
Others	-	13	-	1944	1944	
Total	268	3069	456758	580698	1037456	

It is apparent from these figures that even for illness not treated, some expenditure was incurred, possibly for medicine based on one's own experience or advice from the medical shop. While treatment on the average by allopathy and ayurveda has cost more or less the same per episode of acute ailment, homoeopathy has cost less. The overall average cost of treatment works out to Rs 311 per episode. For cases admitted to hospital, the average cost is Rs 1704 and for cases not admitted Rs 189.

The cost per episode of acute illness admitted to government and private hospitals is given in Table 4.49.

Table 4.49 Cost per episode of acute illness by type of hospital

Type of hospital	Number of cases	Total expenditure (Rs.)	Average per episode (Rs.)
Not admitted	3069	580,698	189.21
Govt. hospital	89	122,604	1377.57
Private hospital	178	333,109	1871.40
Other hospital	1	1045	1045.00
	3337	1037,456	310.89

The distribution of the cost of treatment of acute illness irrespective of the system of medicine is given in Table 4.50 in different class intervals of cost.

Table 4.50 Cost of treatment of acute illness

Cost of treatment (Rs)	Number of cases	Per cent
Below 100	1174	35.18
100 – 249	1237	37.07
250 – 499	505	15.13
500 – 999	247	7.40
1000 – 2499	124	3.72
2500 – 4999	27	0.81
5000 and above	23	0.69
Total	3337	100.00

These figures show that the cost of treatment in a vast majority of cases (72.25 percent) was below Rs 250, in very few cases (5.21 percent) above Rs 1000 and in the remaining (22.54 percent) between Rs 250 and Rs.999.

A further examination of the cost of treatment of acute ailments reveals that the ailments for which the average cost exceeded Rs 1000 were epilepsy and food poisoning/vomiting among children aged 0-4. In the age group 5 and above, disorders of the female genital tract, heart ailments, injuries, appendicitis, hernia, intestinal worm infections, malaria, nutritional deficiency, pleurisy, poisoning, rabies, tumour and typhoid/paratyphoid were the ailments for which the cost of treatment exceeded Rs 1000.

Chronic ailments

As regards chronic illness, the cost of treatment during the previous one month and the cost during the previous one year were recorded. The cost, as obtained from the survey, is given in Table 4.51 separately for each system of medicine.

Table 4.51 Cost of treatment of chronic illness by system of medicine

System of medicine	Number of cases	Cost of treatment during the previous month (Rs.)	Average (Rs.)	Cost of treatment during the previous year (Rs.)	Average (Rs.)
Allopathy	1101	332634	302.12	5081667	4615.50
Ayurveda	109	37320	342.39	371367	3407.04
Homoeopathy	31	5207	167.97	64699	2087.06
Combination	68	25014	367.85	354451	5212.51
Others	8	2340	292.50	32545	4068.13
	1317	402515	305.63	5904729	4483.47

The distribution of the cases of chronic illness by cost of treatment during the previous year is given in Table 4.52.

Table 4.52 Chronic illness by cost of treatment

Cost of treatment (Rs)	Number of chronic cases	Per cent	Total cost previous year(Rs)
0 – 499	74	5.62	31761
500 – 999	127	9.64	94745
1000 – 2499	412	31.28	700211
2500 – 4999	390	29.61	1372518
5000 – 9999	219	16.63	1488896
10000 – 24999	77	5.85	1107473
25000 – 49999	10	0.76	370300
50000 and above	8	0.61	738825
Total	1317	100.00	5904729

The figures show that the cost during the previous year for 46.54 percent of the cases was below Rs 2500, for 76.15 percent of the cases below Rs 5000, and for 7.22 percent of the cases more than Rs 10000.

Of the 1317 cases of chronic illness, 403 had been hospitalised on one or more occasion during the previous year. For them, the average expenditure during the previous month was Rs.496.47 and the average during the previous year was Rs 8318.38. For the remaining 914

cases that were not hospitalised during the previous year, the average expenditure during the previous month was Rs 221.48 and the average during the previous year was Rs 2794.79.

Gender disparity in cost of treatment

The costs of treatment per episode of acute ailment and for each chronic case during the year are given in Table 4.53. It does appear from the figures that the average cost is less for the female sex. The difference in both the cases came out as significant when tested statistically. The results thus offer evidence of gender disparity in the matter of treatment.

Table 4.53 Cost of treatment by age and gender

Age group	Male	Female	Male	Female	Male	Female
ACUTE	Number of episodes		Total cost Rs.		Average cost Rs.	
0 – 4	536	457	135433	91023	252.67	199.18
5-14	333	338	61954	70826	186.05	209.54
15 – 44	323	577	168952	169945	523.07	294.53
45 – 59	182	249	106815	95114	586.90	381.98
60 +	137	205	62201	75193	454.02	366.80
Total	1511	1826	535355	502101	354.03	274.97
CHRONIC	Number of cases		Annual cost Rs.		Average cost Rs.	
0 – 4	12	4	29042	16385	2420.17	2839.19
5 – 14	14	16	71374	99606	5098.14	6225.38
15 – 44	*94*	*155*	*615593*	745210	6548.86	4807.81
45 – 59	191	239	861242	994661	4509.12	4161.76
60 +	270	322	1280038	1201572	4740.88	3731.59
Total	581	736	2857289	3057434	4917.88	4154.12

Source of finance

The source of finance for the treatment was recorded and is given in Table 4.54. Since this item was introduced only when the survey was already in progress, the data are not available for all the cases.

In the case of acute illness, the household was able to find the resources from their own resources in 89.57 percent of cases, the corresponding figure for chronic diseases was only 65.56 percent. For chronic cases the household had to resort to borrowing from moneylenders in 7.78 percent of cases and had to seek help from relatives in 20.03 percent of cases.

Comparison with cost of treatment from other studies

The cost of treatment per episode of acute ailment is Rs 189.21 for cases not hospitalised, Rs 1704.32 for cases hospitalised, and Rs 310.89 for all together according to the present study. The NCAER (1993) study estimated for Kerala the average cost for non-hospitalised

Table 4.54 Source of finance for treatment of illness

Sources	Acute illness		Chronic illness	
	Number	Per cent	Number	Per cent
Own savings	1365	89.57	396	65.56
Moneylender	32	2.10	47	7.78
Bank	-	-	9	1.49
Sale of property	2	0.13	2	0.33
Pledging of jewels/ property	15	0.98	21	3.48
Assistance from relatives	58	3.81	121	20.03
Other sources	52	3.41	8	1.33
Total reported	1524	100.00	604	100.00

illness episode as Rs 171.52 for rural areas and Rs 80.57 for urban areas, yielding a combined figure of Rs 147.87. If a factor of 8 percent per year were allowed to cover increase in cost of living, the NCAER rate would be equivalent to about Rs 250 in the year 2000. The rate of Rs 189 per non-hospitalised case of acute illness obtained from the present study is thus less than but of the same order as the NCAER estimate if cost escalation is allowed for. The NCAER study estimated the expenditure per hospitalised case as Rs 1177.92 for rural areas and Rs 991.24 for urban areas, yielding a combined rate of Rs 1129.38 for the State. When adjusted for an 8 per cent rise per year in consumer price index for the period 1993-2000, this becomes about Rs 1900 which is of the same order as the estimate of Rs 1704 from the present study. The KSSP (1996) study estimated the medical expenditure per morbid person per episode for acute and chronic illness as Rs 165.22 There being no mention of hospitalisation or otherwise, it may be assumed that this refers to non-hospitalised morbidity episodes. Allowing a factor of 8 percent per year for the period 1996-2000 this would work out to about Rs 225 in the year 2000. The corresponding estimate from the present study is Rs 189 per episode of acute illness and Rs 306 during the previous month for chronic ailments. The estimates from the two studies are of the same order.

The per capita cost of treatment according to the present study may be obtained from the cost per episode for acute illness (Rs 310.89), and the cost of treatment during the previous month for chronic illness (Rs 305.63). The incidence rate for acute illness is 47.60 per 1000 for a period of 15 days, which works out to 1158 per 1000 per year. The cost of treatment of 1158 episodes would be Rs 360011. The prevalence rate for chronic diseases is 63.53 per 1000. The cost of treatment of 63.53 chronic cases for one year would be Rs 2, 33,000. Thus the total cost is Rs 593011 for 1000 persons or per capita cost of about Rs 600 per year. The per capita cost of 548.86 mentioned in the KSSP (1996) study becomes Rs 719 when allowance is made for rise in consumer price index. The per capita medical expenditure obtained from the present study by the method given above is thus somewhat less than but of the same order as the KSSP estimate after allowing for rise in consumer price index.

Loss of income

Members of the household who are earners suffer a loss of income if they are unable to go for work. An estimate of this loss was made separately for acute ailments and chronic ailments based on data given in Appendix Table 24. In the case of acute ailments, for the 3337 episodes, only 583 of the affected persons were earners (after excluding children, unemployed, housewives, pensioners, and too old to work). The number of days for which the affected persons could not go for work on account of the illness and the normal rate of earning are known. Thus the total loss of income could be calculated and came to Rs 214384 for all the 583 episodes, the average being Rs 368 per episode. For the 1317 cases of chronic ailments there were 329 earners. The total loss of income for the 329 persons came to Rs 1252060 in a year or Rs 3806 per affected person per year and the loss per month per affected person came to Rs 317.

Total financial burden on household due to illness

The cost of treatment of an episode of acute ailment and the annual cost of treatment of a case of chronic ailment were discussed earlier. The loss of income of an earning member due to absence from work on account of illness was also discussed. We may examine the average financial burden on the household due to illness both on account of treatment cost and on account of loss of income of earning members based on the data given in Appendix Table 24. The total treatment cost for acute ailments has been obtained for different fractile groups of MPCE by using the incidence rate for acute ailments to work out the cost of treatment per year per population of 1000 persons and then converting it to per household basis. Similarly the loss of income due to acute ailments has been calculated by dividing the total loss of income by the total number of acute ailment episodes, using the incidence rate to work out the loss of income in one year for a population of 1000 persons and then converting it to per household basis using the household size. The cost of treatment and the loss of income in one year per household due to chronic illness have also been also worked out from the data of Appendix Table 24 by a similar method. The results are given in Table 4.55. The average household burden came to Rs 327, varying from Rs 184 in the lowest fractile group to Rs 590 in the highest. All the four constituents of the total show a generally increasing trend from the lowest fractile group to the highest.

Table 4.55 Household financial burden due to ailments through treatment and loss of income

Fractile group	Range.	Acute ailments		C
		Cost of treatment per year Rs.	Loss of income per year Rs.	C tr p
I	01-10	723	214	
II	10-20	964	142	
III	20-30	1004	176	
IV	30 - 40	1082	258	
V	40 - 50	1119	199	
VI	50-60	1434	237	
VII	60-70-	1607	296	
VIII	70-80	1639	439	
IX	80-90	1969	468	
X	90-100	4082	787	
		1812	375	

5. Conclusions, Generalisation, and Discussion

In this study, based on a rigorous sampling plan, general morbidity rates as well as morbidity rates for specific ailments have been obtained for the different land sectors. The results have been reviewed in the previous section.

The data were examined to locate possible factors that influence or are associated with morbidity rates. The morbidity for acute illness is less in the age group 15-44 and more in the younger and older age groups, particularly so in the age groups 0-4 and 5-14. For chronic ailments the morbidity is higher in the age group 60+ and to some extent 45-59 also. Within the age group 15-44 morbidity is more among the female sex in respect of both acute and chronic ailments. With reference to water-borne diseases, respiratory diseases, and fever unspecified (which together account for over 70 percent of the total morbidity for acute ailments), the prevalence is more among the age groups 0-4 and 5-14; and the prevalence is relatively more among the female sex within the age group 15-44. The prevalence of asthma is higher among the female sex. This is seen to be true for rheumatism and arthritis also. The prevalence of heart ailments is more among the male sex.

The data have brought out that there is a positive association between morbidity level and level of education in a locality. It is known that morbidity is positively associated with the level of health awareness, and the level of education is an important input to the health awareness. However, the general belief is that within Kerala, the education factor does not influence morbidity since literacy is near 100 percent. The results of the present study have shown otherwise. The results of the study also show that there is a positive association between economic level and morbidity. Another indication from the data is that the number of persons reporting ailments from a household does not increase proportionally with increase in household size.

The morbidity level among Muslims is lower as compared to Hindus and Christians. It is plausible that this may be a result of the differences in age composition. But even after allowing for it, the morbidity for acute ailments remains lower among Muslims. The data reveals that the educational index is lower, the per capita income is lower, and the household size is higher for Muslims. Thus a combination of all these three factors could explain the lower (reported) morbidity level among them. Christians and Hindu Forward castes have a higher prevalence of chronic ailments, which could be explained on the basis of their higher economic level.

There is an indication of gender disparity in the matter of treatment of illness. The proportion of ailments not treated is more among the female sex. The average cost of treatment of an episode of acute ailment and the cost of treatment of a case of chronic ailment is also less among the female sex.

A comparison of the morbidity rates obtained from the 28th round (1974) and the 52nd round (1995-'96) of NSS gives an insight into what the results from a household survey on morbidity portrays. For convenience, the rural rates for the major States given in Table 5.1 may be

considered. The NSS report on the 52nd round states that it is the first comprehensive study on the general health care system in India that is capable of reflecting the outcomes of the National Health Policy formulated and enacted in 1983. It might be assumed that the policy was implemented in all the States. If so it is reasonable to expect that the outcome would be reflected in a reduction of the morbidity between the results of the 28th and 52nd rounds. Table 5.1, however, shows that of the 15 major States, there is a reduction in morbidity rate only in Kerala (Rajasthan and Tamil Nadu also; from 155 to 118). The Kerala rural rate from the 52nd round is just about twice (2.15 times) the all-India rate whereas it was more than three times (3.60 times) according to the 28th round.

Table 5.1 Morbidity rates from 28th and 52nd rounds of NSS

State	28th round	52nd round					
State	Rural	Rural	Rural acute	Rural chronic	Urban	Urban acute	Urban chronic
A.P.	49	64	43	22	61	41	20
Assam	33	80	72	9	86	74	13
Bihar	34	36	26	10	41	32	10
Gujarat	16	46	35	11	36	26	10
Haryana	36	61	47	14	63	46	17
Karnataka	26	45	31	14	40	28	12
Kerala	155	118	80	38	88	61	27
M.P.	33	41	36	5	38	30	7
Maharashtra	44	52	37	15	48	35	13
Orissa	52	62	56	6	62	52	10
Punjab	50	76	56	20	85	60	25
Rajasthan	30	28	22	6	33	24	9
Tamil Nadu	56	52	39	13	58	44	14
Uttar Pradesh	28	61	49	12	72	57	15
West Bengal	62	65	47	19	65	49	16
All India	43	55	42	13	54	41	14

The activities of the Centre and States aim at control/containment of communicable diseases and improvement of health delivery system. Simultaneously other factors such as family planning and education that are inputs to the health awareness level also get the attention of the States. The morbidity rate tends to decrease because of improvement in prevention and treatment of illness, but tends to increase with increased perception due to better health awareness. Developmental activities often lead to higher pollution. Changes in lifestyle and eating habits consequent on improved economic capacity lead to increased morbidity. The morbidity rates from a survey reflect the resultant of all such complex factors. Unlike in other States, in Kerala, with literacy rate of 91 percent (Census 2001), life expectancy at birth of 70 (1993-'97), infant mortality of 14 per 1000 live births (1998), and death rate of 6.4 per 1000 (1999), the awareness factor has reached a near saturation level and cannot

contribute substantially to further increase in morbidity rate. This is a possible interpretation why the morbidity rate according to the 52nd round of NSS has noticeably decreased only in Kerala. The rural rates from the 28th and from the 52nd rounds are practically the same in Bihar (34 and 36), Rajasthan (30 and 28), Tamil Nadu (56 and 52), and West Bengal (62 and 65). The remaining 10 States registered an increase in this aspect. The rate for rural India has also gone up from 43 to 55. If the urban rates according to the NSS 52nd round (also given in Table 5.1) are examined it is seen that even though Kerala has a higher morbidity (88 per 1000) as compared to the all-India rate (55 per 1000) there are major States (Assam with 86 per 1000 and Punjab with 85 per 1000) which come very close to it. The urban morbidity in Kerala is only 1.63 times the all-India urban morbidity. Thus the gap between the morbidity rate in Kerala and the morbidity rates in the other States as seen from the 28th round of NSS has become much less.

In respect of 'serious communicable diseases', the rate obtained by NCAER (1995) for Kerala was 15.97 per 1000 as against the all-India rate of 15.15. Nine States showed a lower rate and seven States showed a higher rate. For the second category of 'other acute illness', the rate for Kerala was 115.38 per 1000 and the all-India rate 75.89, only one State (Orissa) showing a higher rate. For the third category of 'chronic illness', the rate for Kerala was 60.47 and was the highest while the all-India rate was 14.66 per 1000. The total for the three categories gave 191.82 per 1000 for Kerala, which was the highest, the all-India rate being 105.66. (The NCAER results are based on a reference period of 30 days and not 15 days as in the present and most other studies.) Thus it is seen from the 1993 NCAER study that Kerala's morbidity rate for serious communicable diseases is comparable to that of other States even without making allowance for the higher awareness level. In respect of the other two categories, the morbidity rate for Kerala is higher as compared to other States in India but this disparity has to be viewed in the context of the higher awareness. The component of chronic morbidity was highest for Kerala according to the NCAER study; 32 percent. If, however, the acute morbidity rate were converted to a 15-day reference period, it would be about 47 percent. If the NSS 52nd round results are considered, the chronic to total morbidity ratio is second highest in Kerala (the first position going to Andhra Pradesh, both the States having a chronic component in the neighbourhood of 33 percent). The chronic to total morbidity ratio from the present study is a little over 50 percent. A predominance of the chronic component as seen above is in line with the understanding that as countries pass through the health transition the burden of disease shifts away from communicable diseases to non-communicable diseases. Murray and Lopez (Global Comparative Assessments in the Health Sector, WHO, 1994) have shown that communicable diseases together with maternal and perinatal ailments account for about 9 percent of the total years of life lived with disability in the Established Market Economies, whereas the corresponding figure is 44 percent for Sub Saharan Africa and 27 percent for India. Among the States within India, a similar differentiation linked to the human development index may be visualised.

The morbidity rates, general as well as for specific ailments, obtained from National or State level surveys may not be sufficient to the State to take appropriate action for ensuring health for all since they do not provide information on the morbidity profile for a locality with any degree of accuracy. For meeting that requirement, locality-based studies carried out at frequent intervals can help. In-depth morbidity surveys (with repeated visits to households and with

involvement of medical personnel) carried out in each *panchayat* (or groups of *panchayats*) and in each municipality/corporation at intervals of about five years are essential for fine tuning of the health delivery system with the object of planning for health for all.

6. Summary

Plan of the project

Morbidity indicators have been obtained based on a survey covering the rural and urban areas of the State. A deep sampling plan has been used so that the natural regions – highland, lowland, and midland – within the rural sector are properly represented. The survey was spread over one full year from the middle of February 2000 to account for seasonal variations. Wards within *panchayats*/municipalities/corporations formed the first stage units. Households within the sample wards constituted the second stage units. In all 192 sample wards were selected.

In each ward 200 households were visited to collect basic information about the household size, number of persons reporting illness – acute illness among children aged 0-4, acute illness among persons aged 5+ and chronic illness. The period of reference was 15 days prior to the visit of the investigator for acute ailments and one year prior to the visit for chronic ailments. The infrastructure facilities available were also recorded for each ward.

From each ward, 20 out of the 200 houses visited were taken up for detailed evaluation. These 20 consisted of 5 reporting chronic illness, 5 reporting acute illness among children aged 0-4 and 10 reporting acute illness in the other age groups. Within the households selected, all the cases of illness that had occurred in the households during the reference period were investigated. Details about the nature of the disease, duration, status of the ailments with respect to the reference period, nature of treatment, and expenditure were recorded for each case. Full details of the members of household in terms of age and sex structure, educational level, income and all other relevant information were recorded.

The general morbidity rates were worked out from the data collected from the 200 households of the 192 wards that is 38400 households in all. The rates pertaining to specific ailments were obtained from these using the results of the detailed investigation carried out in 20 out of the 200 households from each ward.

Morbidity indicators

The estimated morbidity rates for acute illness for the State are 164 per 1000 for the age group 0-4 and 58 per 1000 for all ages. This rate indicates the number of persons out of 1000 who were ill at any time during the reference period of 15 days. The estimated morbidity rate for chronic illness is 64 per 1000. The rates for the rural (separately for the highland, lowland, and midland regions) and the urban sectors have also been worked out.

Corresponding to the morbidity prevalence rates for different regions for acute illness, the incidence rates (which give the number of new episodes of illness per 1000 of population starting within the reference period) have been obtained. The incidence rates for a period of 15 days are 146 per 1000 for children in the age group 0-4 and 48 per 1000 for all age groups together.

The point prevalence rate, which gives the average number of cases prevalent on a day, has come out as 44 per 1000 for children in the age group 0-4 and 20 per 1000 for all ages together. This applies only to acute illness. Since chronic illness cases are supposed to exist throughout the year, the morbidity prevalence rate for chronic diseases may be added to the point prevalence rate to give a figure of 84 per 1000 for the total point prevalence rate. Excluding chronic illness, the number of person-days lived with (acute) illness is about 7500 per 1000 persons per year.

The morbidity rates for individual diseases/disease groups have been worked out both for acute illness and for chronic illness.

In the age group 0-4 water-borne diseases account for 5 percent of the morbidity, respiratory diseases for 38 percent, and fever for 48 percent of the acute morbidity.

In all age groups together water-borne diseases account for 4 percent, respiratory diseases for 32 per cent, and fever for 37 percent of the acute morbidity. The corresponding morbidity rates are 2.26 per 1000, 18.40 per 1000, and 21.48 per 1000.

Diabetes, blood pressure, asthma, rheumatism, and heart ailments account for over 70 percent of chronic morbidity. The corresponding morbidity rates per 1000 obtained are 10.82, 10.60, 10.25, 7.57, and 6.85.

Associates

Age and gender

Acute morbidity is highest in the age group 0-4. Within this age group there is no gender differential in morbidity rate.

Acute morbidity is lowest in the age group 15-44. It is higher in the age group 5-9 and to a lesser extent in the age groups 10-14, 45-59, and 60+. This is also true when males and females are considered separately.

In the age group 15-44 acute morbidity is higher among the female sex as compared to the male. This is so to a lesser extent in the age groups 45-59 and 60+ also. In the age groups 5-9 and 10-14 there is no such gender differential.

Chronic morbidity is lower in the age groups 0-14 and 15-44. It is higher in the age group 45-59 and is highest in the age group 60+. This is also true when males and females are considered separately.

Chronic morbidity is higher among the female sex (as compared to the male sex) in the age group 15-44. There is indication of a higher prevalence of blood pressure problems and rheumatism in the higher age groups among females as compared to males. As regards heart ailments, the picture is the other way, the prevalence being more among the male sex.

Educational level, economic level and household size

The morbidity rate tends to increase with educational level and with economic level. There is also an indication that it tends to decrease with household size.

Religion and social group

Acute morbidity is lower among Muslims as compared to Hindus and Christians. This is so even after allowing for differences in age structure. Chronic morbidity also appears to be less among Muslims but the difference vanishes when allowance is made for the differences in age structure. Within Hindus chronic morbidity is higher among Hindu Forward castes as compared to Scheduled Castes and Scheduled Tribes, and Hindu Backward castes. Christians do also do have high chronic morbidity.

Seasonality

Acute morbidity is higher during the period June to August, which corresponds to the peak monsoon period.

Rural/urban disparity

The morbidity for chronic ailments is higher in urban areas. In particular, diabetes and blood pressure problems are more prevalent in urban areas.

Gender disparity

The proportion of episodes of acute ailment not treated is higher among the female sex. The average cost of treatment of an episode of acute ailment is less among the female sex. This is also true as regards the average annual cost of treatment of a chronic case.

System of medicine

Allopathy is the preferred system of medicine, more than 80 percent resorting to it for treatment of both acute and chronic illness.

Source of treatment

For treatment of acute ailments 64 percent resort to private sources and 34 percent to government sources. The utilisation of PHC system for treatment is minimal with only 2 percent of the cases having approached PHC/CHC/ANM/LHV for treatment.

Consequences

An estimate of the total number of days of work lost because of acute morbidity came out as 4800 per 1000 persons in a year. The major contributors to this loss were fever, diseases of upper respiratory tract, influenza, bronchitis and injuries, accounting for over 60 percent.

Similarly the number of days of work lost due to chronic illness is 4400 per 1000 person in a year.

An estimate of the total annual addition of chronic cases in the State is of the order of 1.6 lakh. The main constituents of this are: diabetes – 18 percent; blood pressure problems – 9 percent; asthma – 6 percent; rheumatism and arthritis – 13 percent; heart ailments – 12 percent; cancer – 7 percent; and mental ailments – 1 percent.

Cost aspects

The average cost of treatment of acute illness came to Rs 311 per episode; the average for hospitalised episodes being Rs 1704 and for non-hospitalised episodes Rs 189.

The average cost of treatment of chronic illness came to Rs 306 per case per month.

The average loss of income of an earning member suffering from acute ailment is Rs 368 per episode of acute illness. Similarly the average loss of income of an earning member suffering from a chronic ailment is Rs 317 per month.

An estimate of the total financial burden on a household due to treatment of acute and chronic ailments and loss of income of earning members is on the average Rs 327 per month.

Recommendations

There is a case for in-depth study of morbidity on a local level basis. It may first be carried out in a few selected *panchayats* and municipalities. The study may be planned and conducted by statisticians, but close association with medical personnel is essential. There should be repeated visits to the households by the investigators. The data, which should include details of diseases, disabilities and deaths, should be scrutinised in detail by medical persons who should also visit households for cross-checking. The data should be analysed by statistical professionals. With the experience obtained from the survey in a few selected localities, a standard procedure could be evolved and passed on to PHCs for continuous implementation. The data thus collected should be subjected to analysis on a regular basis. This will ensure that information regarding disease and its burden will be available on a local level basis. Such information is essential for proactive steps to be taken by the local bodies for ensuring health for all and for fine tuning of the health delivery system.

If PHCs are equipped to offer medical treatment, apart from being centres for immunisation and services related to childbirth, it needs to be investigated why people do not fully use the facility for treatment of illness. The PHCs, which constitute the nerve centres for health delivery systems particularly in a decentralised set-up, should be enabled to function as effective first level curative centres so that the resources of the taluk- and district-level hospitals are not unduly strained.

Appendix

Table 1 Estimates of morbidity rates for each sector

Sector	Sub sam-ple	Total household size	Number of persons reporting ailments			M
			Acute age 0-4	Acute age 5 +	Chronic	Acut age 0-
Rural Highland	1	9776	154	367	622	15.75
	2	10093	137	425	638	13.57
						14.66
Rural Lowland	1	12076	179	646	624	14.82
	2	11879	225	584	608	18.94
						16.88
Rural Midland	1	37660	551	1395	2539	14.63
	2	37210	550	1593	2294	14.78
						14.71
Rural	1	59512	884	2408	3785	14.85
	2	59182	912	2602	3540	15.41
						15.13
Urban	1	28907	410	1246	2108	14.18
	2	28974	437	1295	1870	15.08
State *						14.63
						15.00

* State rates obtained by combining rural and urban rates with weights 0

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Table 2   Estimates of morbidity by season

Sector	Round	Total household size	Nun Acute age 0-4
Rural	1	29046	482
	2	30860	546
	3	29486	383
	4	29302	385
Urban	1	14715	202
	2	14279	216
	3	15388	250
	4	13499	179
State *	1		
	2		
	3		
	4		

* State rates obtained by combining rural and

* *State rates obtained by combining rural and*

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Table 3 Distribution by religion / social group, age and sex of population of households selected for collecting detailed data

Religion	Social group	Sex	0-4	5-9	10-14	15-19	20-24	25-
HINDU	Scheduled Caste	M	109	62	58	58	76	
		F	106	56	60	81	101	1
		Total	215	118	118	139	177	1
	Scheduled Tribe	M	22	19	20	26	25	
		F	25	21	18	23	22	
		Total	47	40	38	49	47	
	Hindu Backward	M	368	231	249	217	222	2
		F	324	216	228	234	289	3
		Total	692	447	477	451	511	6
	Others	M	155	93	95	82	85	1
		F	137	115	91	109	126	1
		Total	292	208	186	191	211	2
		Total	**1,246**	**813**	**819**	**830**	**946**	**1,1**
CHRISTIAN	Christian Backward	M	0	1	0	0	1	
		F	0	0	0	2	0	
		Total	0	1	0	2	1	
	Christian others	M	56	33	24	33	32	
		F	52	36	37	27	50	
		Total	108	69	61	60	82	
	Christian	M	136	86	86	71	91	1
		F	103	92	69	70	100	1
		Total	239	178	155	141	191	2
		Total	**347**	**248**	**216**	**203**	**274**	**2**

Table 3 Contd.

Religion	Social group	Sex	0-4	5-9	10-14	15-19	20-24	25-
MUSLIM	Muslim	M	325	276	257	287	207	1
		F	325	260	320	283	288	2
		Total	**650**	**536**	**577**	**570**	**495**	**4**
OTHERS	Others	M	2	0	1	2	1	
		F	1	0	3	1	2	
		Total	**3**	**0**	**4**	**3**	**3**	
All		**Total**	**2,246**	**1,597**	**1,616**	**1,606**	**1,718**	**1,8**

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Table 4   Distribution by religion / social group, age and sex of persons with ailments

Religion	Social Group	Age Group	No. of households	No. of persons	Illness 4
Hindu	SC	0 to 4	151	215	
		5 to 14	161	236	
		15 to 44	345	887	
		45 to 59	181	237	
		60+	127	155	
		Total	**359**	1,730	
	ST	0 to 4	36	47	
		5 to 14	52	78	
		15 to 44	95	229	
		45 to 59	50	65	
		60+	31	37	
		Total	**99**	456	
	HB	0 to 4	516	692	
		5 to 14	589	924	
		15 to 44	1203	3,024	
		45 to 59	633	830	
		60+	535	693	
		Total	**1256**	6,163	
	HF	0 to 4	234	292	
		5 to 14	260	394	
		15 to 44	567	1,307	
		45 to 59	326	433	
		60+	292	397	
		Total	**618**	2,823	
		0 to 4	937	1,246	
		5 to 14	1062	1,632	

Table 4 Contd.

Religion	Social Group	Age Group	No.of households	No.of persons	Illness 0 - 4
Christian	ST	5 to 14	1	1	
		15 to 44	2	6	
		45 to 59	1	1	
		Total	**2**	8	
	CB	0 to 4	75	108	5
		5 to 14	85	130	
		15 to 44	193	465	
		45 to 59	87	115	
		60+	87	118	
		Total	**201**	936	5
	Others	0 to 4	195	239	12
		5 to 14	227	333	
		15 to 44	457	1,027	
		45 to 59	220	308	
		60+	201	274	
		Total	**492**	2,181	12
	Total	0 to 4	270	347	17
		5 to 14	313	464	
		15 to 44	652	1,498	
		45 to 59	308	424	
		60+	288	392	
		Total	**695**	3,125	17
Islam	Others	0 to 4	428	650	21
		5 to 14	568	1,113	
		15 to 44	796	2,366	
		45 to 59	418	535	
		60+	277	338	
		Total	**809**	5,002	21

Table 5 Acute morbidity - Age 0-4

Code	Ailment	Number of cases	Percent	M... id ra
	Waterborne diseases			
19	Diarrhoea / Dysentery	29	4.30	0.
68	Typhoid and paratyphoid	1	0.15	0.
34	Hepatitis / Jaundice	1	0.15	0.
		31	**4.60**	**0.**
	Respiratory diseases			
23	Disorders of upper respiratory tract	164	24.33	3.
10	Bronchitis	21	3.12	0.
54	Pneumonia	2	0.30	0.
38	Influenza	44	6.53	0.
6	Asthma	7	1.04	0.
74	Whooping cough	4	0.59	0.
		242	**35.91**	**5.**
	Fever non-specific	**351**	**52.08**	**7.**
	Measles, Mumps, Chickenpox etc.			
45	Measles	1	0.15	0.
49	Mumps	1	0.15	0.
13	Chickenpox	2	0.30	0.
36	Herpes	1	0.15	0.
65	Tuberculosis pulmonary	0	0.00	0.
		5	**0.74**	**0.**

Table 5 Contd.

Code	Ailment	Rural		
		Number of cases	Percent	Morbidity rate
22	Diseases of skin	17	2.52	0.38
21	Diseases of ear	14	2.08	0.3.
24	Disorders of eye	1	0.15	0.0.
17	Dental problems	0	0.00	0.00
2	Anaemia	1	0.15	0.0.
29	Epilepsy	0	0.00	0.00
33	Heart ailments	1	0.15	0.0.
41	Kidney and urinary tract disorders	1	0.15	0.0.
71	Stomach pain non-specific	1	0.15	0.0.
31	Food poisoning/Vomiting/Indigestion	1	0.15	0.0.
1	Amoebiasis	1	0.15	0.0.
39	Injuries	5	0.74	0.1.
70	Undiagnosed headache	0	0.00	0.00
75	Ailment not classified elsewhere	2	0.30	0.0.

* State rates obtained by combining rural and urban rates with weights 0.74 and 0.26.

Table 6   Acute morbidity - age 5 and above

Code	Ailment	Rural	
		Number of cases	Per cent
	Waterborne infections		
19	Diarrhoea/Dysentery	39	2.50
68	Typhoid, paratyphoid	8	0.51
34	Hepatitis/Jaundice	4	0.26
		51	**3.26**
	Respiratory diseases		
23	Diseases of upper respiratory tract	255	16.31
10	Bronchitis	36	2.30
54	Pneumonia	4	0.26
38	Influenza	116	7.42
53	Pleurisy	2	0.13
6	Asthma	20	1.28
74	Whooping cough	8	0.51
		441	**28.21**
69	**Fever non-specific**	**531**	**33.97**
	Measles, Mumps, Chickenpox etc		
45	Measles	2	0.13
49	Mumps	5	0.32
64	Tetanus	1	0.06
30	Filaria	1	0.06
44	Malaria	1	0.06
13	Chickenpox	6	0.38
65	Tuberculosis pulmonary	2	0.13
20	Diphtheria	1	0.06
56	Poliomyelitis		0.00
		19	**1.22**

Table 6   Contd.

Code	Ailment	Rural	
		Number of cases	Per cent
22	Diseases of skin	40	2.56
21	Diseases of ear	24	1.54
24	Disorderes of eye	40	2.56
17	Dental problems	39	2.50
18	Diabetes	25	1.60
41	Kidney and urinary tract disorders	10	0.64
26	Disorders of female genital tract	10	0.64
25	Disorders of breast	6	0.38
33	Heart ailments	12	0.77
60	Rheumatic fever	8	0.51
48	Migraine	1	0.06
70	Headache non-specific	41	2.62
61	Rheumatism	32	2.05
5	Arthritis	5	0.32
11	Burns	3	0.19
12	Cancer other than blood cancer	1	0.06
67	Tumour other than cancer	3	0.19
2	Anaemia	1	0.06
27	Diseases of thyroid gland		0.00
28	Encephalitis	1	0.06
29	Epilepsy	3	0.19
51	Parkinson's disease	2	0.13
62	Spondulitis	4	0.26
63	Stroke		0.00
58	Rabies		0.00
7	Bites by insects such as scorpion	5	0.32

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Table 6 Contd.

Code	Ailment	Rural	
		Number of cases	Per cent
9	Snake bite	1	0.06
8	Bite by dog, monkey etc	2	0.13
55	Poisoning other than snake/insect bite	1	0.06
31	Food poisoning	5	0.32
32	Gastric ulcer, peptic ulcer	6	0.38
71	Stomach pain non-specific	29	1.86
72	Varicose veins	4	0.26
76	Blood pressure	27	1.73
1	Amoebiasis	1	0.06
40	Intestinal worm infection		0.00
59	Rat fever (Weil's disease)	1	0.06
50	Nutritional deficiencies	1	0.06
35	Hernia	2	0.13
4	Appendicitis	6	0.38
39	Injuries	51	3.26
75	Ailments not classified elsewhere	68	4.35
	Grand Total	**1563**	**100.00**

State rates obtained by combining rural and urban rates with weights 0.74 and 0.26.

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Table 7   Acute morbidity - All ages

Code	Ailment	Number of cases	Rural Per cent
	Waterborne infections		
19	Diarrhoea/Dysentery	68	3.04
68	Typhoid, paratyphoid	9	0.40
34	Hepatitis/Jaundice	5	0.22
		82	**3.67**
	Respiratory diseases		
23	Diseases of upper respiratory tract	419	18.73
10	Bronchitis	57	2.55
54	Pneumonia	6	0.27
38	Influenza	160	7.15
53	Pleurisy	2	0.09
6	Asthma	27	1.21
74	Whooping cough	12	0.54
		683	**30.49**
69	**Fever non-specific**	**882**	**38.72**
	Measles, Mumps, Chickenpox, etc		
45	Measles	3	0.13
49	Mumps	6	0.27
64	Tetanus	1	0.04
30	Filaria	1	0.04
44	Malaria	1	0.04
13	Chickenpox	8	0.36
65	Tuberculosis pulmonary	2	0.09
20	Diphtheria	1	0.04
56	Poliomyelitis	0	0.00

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Table 7 Contd.

Code	Ailment	Number of cases	Rural Per cent
36	Herpes	1	0.04
		24	**1.07**
22	Diseases of skin	57	2.55
21	Diseases of ear	38	1.70
24	Disorders of eye	41	1.83
17	Dental problems	39	1.74
18	Diabetes	25	1.12
41	Kidney and urinary tract disorders	11	0.49
26	Disorders of female genital tract	10	0.45
25	Disorders of breast	6	0.27
33	Heart ailments	13	0.58
60	Rheumatic fever	8	0.36
48	Migraine	1	0.04
70	Headache non-specific	41	1.83
61	Rheumatism	32	1.43
5	Arthritis	5	0.22
11	Burns	3	0.13
12	Cancer other than blood cancer	1	0.04
67	Tumour other than cancer	3	0.13
2	Anaemia	2	0.09
27	Diseases of thyroid gland	0	0.00
28	Encephalitis	1	0.04
29	Epilepsy	3	0.13
51	Parkinson's disease	2	0.09
62	Spondylitis	4	0.18
63	Stroke	0	0.00

Table 7. Contd.

Code	Ailment	Rural	
		Number of cases	Per cent
58	Rabies	0	0.00
7	Bites by insects such as scorpion	5	0.22
9	Snake bite	1	0.04
8	Bite by dog, monkey, etc	2	0.09
55	Poisoning other than snake/insect bite	1	0.04
31	Food poisoning	6	0.27
32	Gastric ulcer, peptic ulcer	6	0.27
71	Stomach pain non-specific	30	1.34
72	Varicose veins	4	0.18
76	Blood pressure	27	1.21
1	Amoebiasis	2	0.09
40	Intestinal worm infection	0	0.00
59	Rat fever (Weil's disease)	1	0.04
50	Nutritional deficiencies	1	0.04
35	Hernia	2	0.09
4	Appendicitis	6	0.27
39	Injuries	56	2.50
75	Ailments not classified elsewhere	70	3.13
	Grand Total	**2237**	**100.00**

State rates obtained by combining rural and urban rates with weights 0.74 and 0.26.

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Table 8 Morbidity Prevalence - Chronic

Code	Ailment	Rural		Mor y r
		Number of cases	Per cent	
18	Diabetes	128	15.33	9.
76	Blood pressure	126	15.09	9.
6	Asthma	142	17.01	10
61	Rheumatism	110	13.17	8.
33	Heart ailments	94	11.26	6.
60	Rheumatic fever	1	0.12	0.
47	Mental disorders	23	2.75	1.
12	Cancer other than blood cancer	21	2.51	1.
43	Leukaemia	1	0.12	0.
67	Tumour other than cancer	0	0.00	0.
65	Tuberculosis pulmonary	20	2.40	1.
66	Tuberculosis other than pulmonary	8	0.96	0.
10	Bronchitis	1	0.12	0.
32	Gastric ulcer, peptic ulcer	23	2.75	1.
22	Diseases of skin	17	2.04	1.
42	Leprosy	1	0.12	0.
29	Epilepsy	8	0.96	0.
51	Parkinson's disease	2	0.24	0.
28	Encephalitis	1	0.12	0.
63	Stroke	10	1.20	0.
48	Migraine	6	0.72	0.
70	Head ache non-specific	6	0.72	0.
5	Arthritis	8	0.96	0.
62	Spondylitis	3	0.36	0.

Table 8. Contd.

Code	Ailment	Rural		
		Number of cases	Per cent	Mor y r
27	Disorders of thyroid gland	8	0.96	0.
24	Disorders of eye	10	1.20	0.
21	Disorders of ear	5	0.60	0.
41	Kidney and urinary disorders	9	1.08	0.
26	Diseases of female genital tract	7	0.84	0.
25	Disorders of breast	0	0.00	0.
15	Congenital anomalies	3	0.36	0.
35	Hernia	2	0.24	0.
30	Filaria	0	0.00	0.
71	Stomach ache non-specific	8	0.96	0.
11	Burns	0	0.00	0.
39	Injuries	5	0.60	0.
17	Dental problems	1	0.12	0.
2	Anaemia	0	0.00	0.
23	Disorders of upper respiratory tract	1	0.12	0.
34	Hepatitis / Jaundice	1	0.12	0.
56	Poliomylitis	2	0.24	0.
69	Fever non-specific	3	0.36	0.
72	Varicose vein / piles	0	0.00	0.
75	Ailments not classified elsewhere	10	1.20	0.
	Total	835	100.00	61

State rates obtained by combining rural and urban rates with weights 0.74 and 0.26.

Table 9 Status of Episodes of Acute Illness

Status	Illness (Age 0 - 4)	
	Rural	Urban
Started and ended within the reference period	441	218
Started earlier and ended within the reference period	49	21
Started within the reference period and continuing on the date of survey	158	72
Started before the reference period and continuing on the date of survey	26	9
Total	674	320
Per cent starting within the reference period	88.87	90.62
Per cent continuing on the date of survey	27.30	25.31

Table 10 Acute Illness Not Treated – Reasons

Reason for not treating	Age 0 – 4		Age 5 and above	
	Male	Female	Male	Female
No medical facility	2	1	0	4
Lack of faith in the available system of medicine	0	0	2	0
Treatment costly	0	1	0	3
Ailment not serious	12	7	52	103
Other reasons	6	2	4	7
Number not treated	20	11	58	117
Total number of cases	536	458	976	1367
Per cent not treated	3.73	2.40	5.94	8.56

Table 11 Duration of Acute Illness

Sector	Age 0-4		
	No. of cases	Total duration in days	No. of c
Rural	674	3867	156:
Urban	320	1773	780
Total	994	5640	234:

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Table 12 Acute Illness Preventing from Work

Code	Ailment	Total no. of cases	N... p... f...
69	Fever non-specific	1225	
23	Diseases of upper respiratory tract	692	
38	Influenza	245	
39	Injuries	93	
10	Bronchitis / Eosonophilia	79	
75	Ailments not classified elsewhere	104	
19	Diarrhoea / dysentery	109	
24	Disorders of eye	59	
18	Diabetes	39	
61	Rheumatism	45	
76	Blood pressure	48	
70	Headache non-specific	59	
22	Diseases of skin	85	
6	Asthma	33	
33	Heart ailments	24	
71	Stomach-ache non-specific	41	
17	Dental/oral problems	62	
21	Diseases of ear	62	
34	Hepatitis / Jaundice	13	
4	Appendicitis	10	
26	Disorders of female genital tract	12	
74	Whooping cough	19	
41	Kidney diseases and urinary tract infections	17	
13	Chicken pox	11	
5	Arthritis	9	
68	Typhoid / paratyphoid	11	
60	Rheumatic fever	12	
25	Disorders of breast	7	
54	Pneumonia	8	

Table 12 Contd.

Code	Illness	Total no. of cases	p
53	Pleurisy	2	
51	Parkinson's diseases	2	
55	Poisoning due to causes other than snake and insect bites	3	
31	Food poisoning	6	
56	Polio	1	
58	Rabies	1	
1	Amoebiasis	4	
7	Bite by insects such as scorpion	5	
40	Intestinal worm infection	1	
30	Filaria	1	
63	Stroke	1	
8	Bite by dog , monkey, etc.	3	
27	Disorders of thyroid gland	2	
50	Nutritional deficiencies	1	
59	Rat fever	1	
64	Tetanus	1	
28	Encephalitis	1	
20	Diptheria	1	
12	Cancer other than blood cancer	1	
2	Anaemia	2	
48	Migraine	2	
9	Bite by snake	1	
	Total	**3337**	

Table 13 Chronic Illness Preventing from Work

Code	Ailment	Total no. of cases	N... p... f...
6	Asthma	209	
33	Heart ailments	140	
61	Rheumatism	152	
18	Diabetes	231	
76	Blood pressure	226	
47	Mental disorders	33	
12	Cancer other than blood cancer	28	
65	Tuberculosis-Pulmonary	28	
63	Stroke	14	
39	Injuries	8	
32	Gastric ulcer, peptic ulcer	27	
15	Congenital anomalies	5	
41	Kidney diseases and urinary tract infections	15	
75	Ailments not classified elsewhere	25	
29	Epilepsy	18	
26	Disorders of female genital tract	11	
70	Headache non-specific	7	
24	Disorders of eye	11	
48	Migraine	12	
51	Parkinson's disease	3	
66	Tuberculosis other than pulmonary	9	
62	Spondylitis	7	
22	Diseases of skin	23	
5	Arthritis	15	
27	Disorders of thyroid gland	12	
42	Leprosy	2	

Table 13 Contd.

Code	Illness	Total no. of cases	N... (pre... fro...
72	Varicose veins/Piles	1	
10	Bronchitis / Eosinophilia	4	
69	Fever non-specific	3	
28	Encephalitis	1	
25	Disorders of breast	1	
17	Dental / Oral problems	1	
23	Diseases of upper respiratory tract	1	
	Total	1317	

Table 14 Age and Sex Distribution of the Population of Households by Sector

Age	Male			Female			
	Rural	Urban	Total	Rural	Urban	Total	
0 - 4	766	407	1173	743	330	1073	
5 - 9	554	247	801	543	253	796	
10 - 14	555	235	790	575	251	826	
15 - 19	548	228	776	541	289	830	
20 - 24	524	216	740	672	306	978	
25 - 29	539	242	781	662	378	1040	
30 - 34	540	292	832	556	274	830	
35 - 39	502	284	786	457	240	697	
40 - 44	341	188	529	331	172	503	
45 - 49	310	190	500	353	169	522	
50 - 54	259	137	396	296	149	445	
55 - 59	201	86	287	246	132	378	
60 - 64	208	111	319	247	127	374	
65+	391	219	610	448	262	710	
Total	**6,238**	**3,082**	**9,320**	**6,670**	**3,332**	**10,002**	**1**

Table 15 Acute Illness by Disease, Age and Sex

Code		0 – 4		5 –
		Male	Female	Male
	Waterborne infections			
19	Diarrhoea/Dysentery	22	30	9
68	Typhoid, paratyphoid	1	0	0
34	Hepatitis/Jaundice	0	1	0
	Respiratory diseases			
23	Diseases of upper respiratory tract	144	127	58
10	Bronchitis	8	17	2
54	Pneumonia	2	1	2
38	Influenza	48	25	8
53	Pleurisy	0	0	0
6	Asthma	5	4	3
74	Whooping cough	6	1	2
69	**Fever non-specific**	253	215	73
	Measles, Mumps, Chickenpox, etc			
45	Measles	2	0	0
49	Mumps	1	0	5
64	Tetanus	0	0	0
30	Filaria	0	0	0
44	Malaria	0	0	0
13	Chickenpox	1	2	2
65	Tuberculosis pulmonary	0	2	2
20	Diphtheria	0	0	0
56	Poliomyelitis	0	0	0
36	Herpes	1	0	0

Table 15 Contd.

Code		0 – 4		5
		Male	Female	Male
22	Diseases of skin	11	12	4
21	Diseases of ear	12	9	2
24	Disorders of eyes	1	1	4
17	Dental problems	1	0	3
18	Diabetes	0	0	0
41	Kidney and urinary tract disorders	2	2	0
26	Disorders of female genital tract	0	0	0
25	Disorders of breast	0	0	0
33	Heart ailments	1	1	0
60	Rheumatic fever	0	0	0
48	Migraine	0	0	0
70	Headache non-specific	1	0	1
61	Rheumatism	0	0	0
5	Arthritis	0	0	0
11	Burns	0	0	0
12	Cancer other than blood cancer	0	0	0
67	Tumour other than cancer	0	0	0
2	Anaemia	1	0	0
27	Diseases of thyroid gland	0	0	0
28	Encephalitis	0	0	0
29	Epilepsy	2	0	0
51	Parkinson's disease	0	0	0
62	Spondylitis	0	0	0
63	Stroke	0	0	0

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Table 15 Contd.

Code		0 – 4		5.
		Male	Female	Male
58	Rabies	0	0	0
7	Bites by insects such as scorpion	0	0	0
9	Snake bite	0	0	0
8	Bite by dog, monkey, etc	0	0	0
55	Poisoning other than snake/insect bite	0	0	0
31	Food poisoning	1	0	2
32	Gastric ulcer, peptic ulcer	0	0	1
71	Stomach pain non-specific	2	2	1
72	Varicose veins	0	0	0
76	Blood pressure	0	0	0
1	Amoebiasis	2	0	0
40	Intestinal worm infection	0	0	0
59	Rat fever (Weil's disease)	0	0	0
50	Nutritional deficiencies	0	0	0
35	Hernia	0	0	0
4	Appendicitis	0	0	0
39	Injuries	2	4	5
75	Ailments not classified elsewhere	3	2	1
	Grand Total	**536**	**458**	**190**

Table 16 Chronic Illness by Age and Sex

Code		0 – 4		5 -
		Male	Female	Male
18	Diabetes	0	0	0
76	Blood pressure	0	0	0
6	Asthma	3	0	2
61	Rheumatism	0	0	0
33	Heart ailments	0	0	0
60	Rheumatic fever	0	0	0
47	Mental disorders	3	0	0
12	Cancer other than blood cancer	0	0	0
43	Leukaemia	0	0	1
67	Tumour other than cancer	0	0	0
65	Tuberculosis pulmonary	2	0	3
66	Tuberculosis other than pulmonary	0	0	0
10	Bronchitis	0	0	0
32	Gastric ulcer, peptic ulcer	0	0	0
22	Diseases of skin	3	2	0
42	Leprosy	0	0	0
29	Epilepsy	0	1	0
51	Parkinson's disease	0	0	0
28	Encephalitis	0	0	0
63	Stroke	0	0	0
48	Migraine	0	0	0
70	Head ache non-specific	0	0	0
5	Arthritis	0	0	0
62	Spondylitis	0	0	0
27	Disorders of thyroid gland	0	0	0
24	Disorders of eye	0	0	0
21	Disorders of ear	0	0	0

Table 16 Contd.

Code		0 – 4		5 -
		Male	Female	Male
41	Kidney and urinary tract disorders	1	0	0
26	Diseases of female genital tract	0	0	0
25	Disorders of breast	0	0	0
15	Congenital anomalies	0	1	0
35	Hernia	0	0	0
30	Filaria	0	0	0
71	Stomach ache non-specific	0	0	0
11	Burns	0	0	0
39	Injuries	0	0	0
17	Dental problems	0	0	0
2	Anaemia	0	0	0
23	Diseases of upper respiratory tract	0	0	0
34	Hepatitis/jaundice	0	0	0
56	Poliomyelitis	0	0	0
69	Fever non-specific	0	0	0
72	Varicose vein	0	0	0
75	Ailments not classified elsewhere	0	0	0
	Grand total	**12**	**4**	**6**

Table 17   Distribution of Households by Household Size and Religion

House-hold size	Hindu					Sched d Tri
	Scheduled Castes	Scheduled Tribes	Hindu Backward	Hindu Forward	Total	
	No.of H/h	No.of H/h	No.of H/h	No.of H/h	No.of H/h	No.of H/t
1	8	2	14	9	33	
2	18	5	55	46	124	
3	57	16	171	96	340	
4	101	34	396	184	715	
5	82	19	275	140	516	
6	39	13	150	75	277	
7	19	4	75	30	128	
8	9	2	49	20	80	
9	13	1	22	6	42	
10	7	0	22	10	39	
11	2	2	12	1	17	
12	1	1	5	-	7	
13	1	-	5	1	7	
14	2	-	2	-	4	
15	-	-	1	-	1	
16	-	-	2	-	2	
17	-	-	-	-	-	
18	-	-	-	-	-	
Total	359	99	1256	618	2332	
Average h/h size	4.82	4.61	4.91	4.57	4.79	4.0

Table 18 Treatment by Systems Other than Allopathy - Acute illness

AYURVEDA		
Code	Ailment	
10	Bronchitis/Eosinophilia	
19	Diarrhoea/Dysentery	
21	Diseases of ear	
22	Diseases of skin	
23	Diseases of upper respiratory tract	
25	Disorder of breast	
34	Hepatitis/Jaundice	
38	Influenza	
39	Injuries	
41	Kidney diseases and urinary tract infections	
49	Mumps	
5	Arthritis	
6	Asthma	
60	Rheumatic fever	
61	Rheumatism	
62	Spondylitis	
69	Fever non-specific	
70	Headache non-specific	
71	Stomach ache non-specific	
75	Ailments not classified elsewhere	
9	Bite by snake	
	Total	

HOMOEOPATHY		
10	Bronchitis/Eosinophilia	
13	Chickenpox	

Table 18 Contd.

23	Diseases of upper respiratory tract	
24	Disorders of eye	
27	Disorders of thyroid gland including goitre	
34	Hepatitis/Jaundice	
38	Influenza	
41	Kidney diseases and urinary tract infections	
45	Measles	
49	Mumps	
6	Asthma	
69	Fever non-specific	
71	Stomach ache non-specific	
74	Whooping cough	
75	Ailments not classified elsewhere	
	Total	
COMBINATION		
13	Chickenpox	
22	Diseases of skin	
23	Diseases of upper respiratory tact	
32	Gastric ulcer, Peptic ulcer	
34	Hepatitis/Jaundice	
61	Rheumatism	
67	Tumour	
76	Blood pressure	
	Total	
OTHERS		
21	Diseases of ear	
23	Diseases of upper respiratory tract	
39	Injuries	
69	Undiagnosed fever	
70	Undiagnosed headache	

Table 19 Treatment by Systems Other than Allopathy – Chronic illness

Code	Ailment	No of c
AYURVEDA		
11	Burns	
18	Diabetes	
22	Diseases of skin	
24	Disorder of eye	
29	Epilepsy	
32	Gastric ulcer, Peptic ulcer	
39	Injuries	
5	Arthritis	
6	Asthma	
60	Rheumatic fever	
61	Rheumatism	
62	Spondylitis	
63	Stroke	
69	Undiagnosed fever	
75	Ailments not classified elsewhere	
76	Blood pressure	
	Total	
HOMOEOPATHY		
18	Diabetes	
22	Diseases of skin	
33	Heart ailments	
48	Migraine	
5	Arthritis	
6	Asthma	
61	Rheumatism	
63	Stroke	

Table 19 Treatment by Systems Other than Allopathy – Chronic illness

	COMBINATION	
12	Cancer other than blood cancer	
18	Diabetes	
22	Diseases of skin	
29	Epilepsy	
33	Heart ailments	
5	Arthritis	
6	Asthma	
61	Rheumatism	
63	Stroke	
71	Undiagnosed stomach pain	
75	Ailments not classified elsewhere	
76	Blood pressure	
	Total	
	OTHERS	
15	Congenital anomalies	
22	Diseases of skin	
32	Gastric ulcer Peptic ulcer	
47	Mental disorders	
6	Asthma	
66	Tuberculosis other than pulmonary	
76	Blood pressure	
	Total	

Table 20 Source of Treatment for Acute Illness

Source	Rural			R
	Highland	Lowland	Midland	
Govt. Hospital	119	124	394	
Private Hospital	113	178	403	
C H C	2	1	2	
P H C	2	4	38	
Private Doctor	110	113	391	
Govt. Doctor	8	25	42	
ANM/ LHV	0	1	0	
Others	5	8	11	
Total	359	454	1281	2

Table 21 Distribution by Sector and Age of Population of Households Selected for Collection of Detailed Data

Age group	Highland	Lowland	Midland	Rural
0-4	253	295	961	1509
5-14	395	422	1410	2227
15-44	1014	1248	3951	6213
45-59	280	333	1052	1665
60+	174	308	812	1294
Total	2116	2606	8186	12908

Table 22 Distribution by Sector and Age of Persons with Ailments

	Age group	Highland	Lowland	Midland	Rural
Acute	0-4	122	143	409	674
	5-14	73	88	294	455
	15-44	116	129	357	602
	45-59	47	62	170	279
	60+	26	64	137	227
	Total	**384**	**486**	**1367**	**2236**
Chronic	0-4	0	2	6	8
	5-14	4	5	10	19
	15-44	39	23	101	163
	45-59	55	66	162	283
	60+	56	61	245	362
	Total	**154**	**157**	**524**	**835**

Table 23   Distribution of Persons with Main Chronic Ailments by Sector and Age

Chronic ailments	Age group	Highland	Lowland	Midland	Rural
Diabetes	5-14	0	0	0	0
	15-44	4	2	6	12
	45-59	7	12	35	54
	60+	6	15	41	62
	Total	17	29	82	128
Heart ailments	5-14	0	1	0	1
	15-44	2	5	14	21
	45-59	6	12	11	29
	60+	5	14	24	43
	Total	13	32	49	94
Arthritis	5-14	0	0	1	1
	15-44	1	0	0	1
	45-59	0	1	0	1
	60+	0	1	4	5
	Total	1	2	5	8
Asthma	0-4	0	0	2	2
	5-14	1	2	0	3
	15-44	4	3	19	26
	45-59	7	15	25	47
	60+	13	10	41	64
	Total	25	30	87	142
Rheumatism	5-14	0	0	0	0
	15-44	5	0	6	11
	45-59	13	2	22	37
	60+	16	7	39	62
	Total	34	9	67	110
e	15-44	1	1	8	10

Table 24   Treatment Cost and Loss of Income due to Acute and Chronic Illness

Mpce Fractiles	Range (Rs)	No. of households	No. of persons	Acute					
				Illness 0 to 4	Illness 5+	All ages	Total Treatment cost	No. of earning members who could not attend work	Total monthly income of
I	103.75 - 376.20	327	1938	109	209	318	33473	58	
II	377.00 - 434.29	318	1927	107	186	293	40248	47	
III	435.00 - 483.75	336	1938	108	192	300	45089	38	
IV	483.80 - 529.29	358	1932	97	215	312	54029	48	
V	530.00 - 580.80	353	1927	104	209	313	55402	50	
VI	581.00 - 639.78	376	1937	89	238	327	78566	55	1
VII	640.00 - 719.25	402	1927	108	221	329	95235	50	1
VIII	719.57 - 826.67	417	1933	88	259	347	105913	68	1
IX	827.00 - 1058.38	450	1932	98	291	389	154033	75	1
X	1059.00 - 6039.00	503	1931	86	323	409	375468	94	40ε
		3840	19322	994	2343	3337	1037456	583	13ᶾ

Table 25 Average Loss of Income per Episode of Acute Illness

Ailment (code)	No.of earning members	Sum of monthly income of earning members	Total no.of days n worked by earnin members
10	12	24900	
11	2	2900	
13	3	8300	
17	16	27000	
18	13	27500	
19	15	23000	
21	14	28520	
22	9	15300	
23	67	163550	1
24	12	26650	
25	2	1200	
26	3	5650	
29	1	2000	
32	5	9100	
33	11	15250	1
34	6	14500	
35	2	3000	
38	51	144500	1
39	43	162750	4
4	1	2500	
40	1	4800	
41	5	10400	
48	1	4500	
5	5	10700	
50	1	1000	
51	2	4000	
53	1	3000	
55	1	2000	
56	1	1800	
58	1	2000	
6	3	4500	

Table 26 Average Loss of Income During One Year per Chronic Ailment

Ailment	No.of earning members	Sum of Monthly Income	Sum of days not worked in one year	Sum of Ann Income
12	5	7000	570	84
17	1	1500	0	18
18	74	262400	2031	3148
21	1	1000	0	12
22	5	3750	0	45
23	1	5000	0	60
24	1	500	30	6
26	2	3200	145	38
27	2	6300	60	75
29	4	7600	102	91
30	1	5000	35	60
32	12	21450	460	257
33	42	110800	2975	1329
35	1	1500	90	18
39	2	3000	405	36
41	5	16750	205	201
47	6	10300	435	123
48	4	8000	330	96
5	1	400	30	4
56	1	1000	25	12
6	49	95450	2762	1145
60	1	4500	15	54
61	31	70450	1930	845
62	4	15000	200	180
63	1	6500	85	78
65	12	23000	1115	276
66	3	3000	155	36
69	1	800	10	9
70	1	600	30	7

Table 27 Educational Index, Household Size, Per Capita Income/Expenditure for Each Sample

Sample no.	Avg eductn index	Avg hh size	Avg per capita exp	Avg per capita income	
L1	8.07	5.55	621.55	831.27	
L10	10.84	5.05	876.85	1197.91	
L100	3.94	4.9	389.29	282.35	
L101	7.35	4.95	789.56	967.92	
L102	7.93	4.15	1010.46	887.92	
L103	7.61	6.9	762.53	858.61	
L104	8.11	4	778.83	1026.67	
L105	11.69	4.75	1202.73	1987.34	
L106	10.71	4.45	986.45	1407.00	
L107	9.54	4.2	421.17	834.42	
L108	10.09	3.6	529.80	1872.21	
L109	9.40	3.35	441.38	835.25	
L11	7.53	4.55	783.25	714.52	
L110	9.23	4.55	660.86	1157.56	
L111	2.14	4.2	431.73	886.00	
L112	8.47	4.55	593.39	1350.21	
L113	7.50	7.1	875.12	800.51	
L114	6.41	5.1	598.57	528.98	
L115	8.03	5.45	682.96	823.58	
L116	10.61	4.25	1244.76	1494.58	
L117	7.62	4.4	742.62	802.92	
L118	9.32	4.5	738.28	728.33	
L119	10.20	4	1134.63	1212.50	
L12	7.51	5.15	659.96	667.12	
L120	9.70	6.95	982.79	1185.23	
L121	6.10	5.45	833.42	730.92	
L122	2.35	3.9	397.55	322.15	
L123	8.27	4.5	1066.76	1413.20	
L124	8.02	3.9	721.41	879.17	

Table 27   Contd.

Sample no.	Avg eductn index	Avg hh size	Avg per capita exp	Avg per capita income
L135	6.46	5.55	618.76	582.49
L136	7.27	5.05	571.37	819.04
L137	7.83	5.4	985.09	896.54
L138	4.84	5.05	608.06	480.03
L139	8.37	4.45	950.89	1002.07
L14	9.67	4.8	524.14	542.63
L140	6.53	4.75	656.34	528.57
L141	6.91	4.7	778.20	809.87
L142	5.24	4.7	551.80	476.58
L143	8.06	5.35	645.95	814.17
L144	9.55	4.05	441.00	957.27
L145	8.23	4.75	568.49	806.21
L146	8.19	5.1	782.67	1220.45
L147	7.95	4.75	626.67	760.95
L148	6.43	4.2	602.73	896.34
L149	13.32	4	1833.41	2526.08
L15	6.99	5.8	568.52	868.09
L150	8.35	4.9	727.21	796.30
L151	10.73	5.15	1240.63	1452.00
L152	7.66	6.55	784.41	772.80
L153	6.27	5	777.13	947.58
L154	8.87	4.5	994.15	860.04
L155	5.79	6.15	500.02	485.84
L156	6.65	6.9	604.34	544.91
L157	7.18	6.35	627.56	915.49
L158	7.25	6.35	573.81	610.09
L159	8.73	6.05	982.70	1242.19
L16	8.98	4.8	718.69	782.46
L160	8.22	4.55	746.68	771.81
L161	9.40	5.6	1240.92	1372.93
L162	8.62	4.5	887.57	960.96

Table 27 Contd.

Sample no.	Avg eductn index	Avg hh size	Avg per capita exp	Avg per capita income	
L174	2.39	4.7	648.71	806.40	
L175	7.49	5.35	746.50	949.43	
L176	8.48	5.1	679.32	845.21	
L177	6.14	5.35	705.77	839.04	
L178	7.54	4.95	855.72	1140.50	
L179	7.89	5.6	687.29	864.67	
L18	6.85	5.65	961.14	582.23	
L180	7.06	6.1	652.02	737.99	
L181	3.24	8.1	552.42	675.03	
L182	3.77	5.45	580.09	649.56	
L183	3.93	5.55	679.32	866.88	
L184	3.27	5.15	661.97	749.84	
L185	3.69	7.25	558.11	963.25	
L186	5.98	4.3	724.93	758.48	
L187	7.83	5.35	650.18	748.42	
L188	7.43	5.25	975.32	1012.97	
L189	10.37	5.35	1275.60	1692.81	
L19	8.55	5.5	1232.04	1502.50	
L190	11.19	3.95	538.65	763.92	
L191	8.77	4.45	473.72	499.40	
L192	9.12	4.35	759.23	794.27	
L2	6.46	5.4	649.21	932.17	
L20	8.76	5.75	752.61	767.58	
L21	6.65	3.85	978.38	872.50	
L22	4.90	4	729.42	612.32	
L23	7.61	4.05	813.92	805.67	
L24	8.60	4.3	826.86	1260.29	
L25	6.57	5.4	616.02	835.35	
L26	8.78	4.25	1186.96	1065.31	
L27	7.07	4.85	634.05	480.15	
L28	7.31	5.6	592.04	940.93	

Table 27 Contd.

Sample no.	Avg eductn index	Avg hh size	Avg per capita exp	Avg per capita income	Acute 0-4
L4	9.43	4.95	1349.83	1306.22	9
L40	8.02	4.2	630.82	735.42	6
L41	7.66	4.75	704.91	833.14	4
L42	7.65	4.8	886.69	732.46	5
L43	9.78	4.4	879.06	1246.65	7
L44	7.47	6.15	595.03	581.82	4
L45	11.81	4.3	1239.30	2551.00	7
L46	11.05	4.65	1345.63	2152.68	5
L47	9.20	4.85	1057.78	1031.43	5
L48	11.06	4	1391.83	1688.12	8
L49	8.68	4.25	939.75	831.81	7
L5	11.56	4.65	1605.87	1258.59	5
L50	7.57	4.8	679.23	995.92	5
L51	6.93	3.75	777.11	1062.00	5
L52	7.25	4.4	1078.45	887.58	9
L53	8.51	6.25	759.31	1002.21	3
L54	11.77	3.25	1076.70	1503.75	5
L55	6.94	5.25	567.35	710.56	7
L56	12.20	4.85	1155.79	1675.67	6
L57	8.70	5.8	677.63	922.60	8
L58	9.05	3.85	970.34	1132.21	7
L59	7.79	5.35	568.69	641.25	6
L6	7.19	4.35	1007.92	950.25	7
L60	8.77	4.1	452.38	720.96	6
L61	9.40	3.8	513.93	630.63	6
L62	10.07	5.6	788.52	927.44	7
L63	10.00	4.1	543.04	893.08	5
L64	7.29	5.9	790.38	1017.13	5
L65	7.69	4.4	637.87	960.98	6
L66	9.24	3.85	424.15	631.17	5
L67	7.75	4.3	762.84	900.97	4
L68	9.25	4.55	418.82	591.38	5

Table 27 Contd.

Sample no.	Avg eductn index	Avg hh size	Avg per capita exp	Avg per capita income	A ag
L8	7.87	4.9	888.90	886.68	
L80	5.90	5.95	621.92	710.15	
L81	8.68	5.65	875.49	1184.42	
L82	6.93	5.55	622.61	736.54	
L83	7.02	4.85	623.52	799.81	
L84	6.30	6.65	628.77	564.77	
L85	5.71	4.65	743.70	904.37	
L86	7.09	6.2	651.81	689.68	
L87	8.24	6.9	804.86	876.37	
L88	4.87	5.05	675.74	607.75	
L89	7.90	5.6	1046.74	904.72	
L9	9.54	5.55	759.59	937.98	
L90	8.71	5.95	722.60	852.40	
L91	5.30	5.25	697.79	562.53	
L92	5.90	4.4	539.42	818.20	
L93	8.34	4.95	972.22	836.53	
L94	7.28	5.6	807.95	699.96	
L95	7.04	4.4	546.24	603.86	
L96	6.68	5.5	804.84	832.08	
L97	5.49	4.8	738.14	826.91	
L98	8.47	4.65	682.28	774.31	
L99	6.32	4.25	757.05	818.42	
	7.79	5.03	754.96	894.08	9

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