

## Chapter - VI

### Health Scenario in Sikkim

#### Health Condition :

Health condition implies the broader sense of "quality of life" rather than the absence of illness of diseases in general. Health situation reveals the entire socio-economic structure of the total population of a region or state. In UNDP Report 1990 the life expectancy was widely accepted as the reflection of total health condition of a country or a community as a whole. As a result health may be defined as a combination of physiological development associated with the reduction of mortality, child mortality, morbidity and etc. and the capacity of both mentally and physically creative. The following are main determinants of health situation; of them the indirect factors includes the overall environmental, geographical condition, social and religious organisation and the economic production and distribution and on the cultural traits of the population. Direct factors are the status of health services which incorporates, infrastructure, organisation, resources mobilisation and flow, output of the health services, sanitation system. The most vital factor is nutritional status of the people which depends on economic condition and food habits of the people and this can be measured through the morbidity, mortality, nutritional and physiological development of the individuals of a given community.

(i) Infrastructure : The health infrastructure is well established in all four districts of the state.

## Hospitals :

1. Referral Hospitals : There is one 300 bedded referral hospital at the capital town, Gangtok. It has Departments of medicine, cardiology, surgery, pediatrics, obs. & Gyn, orthopaedics, Eys and ENT, ophthalmology and psychiatry. With this another 500 bedded special hospital has been sanctioned at Tadong, near Gangtok, with an estimated cost of Rs. 22.70 crores.

2. District Hospitals : There are four district hospitals one each at Singtam in East district Gyalshing in West district, Namchi in South district and Mangan in North district. Namchi hospital is 100 bedded and all the hospitals have laboratory facilities and the rest three district hospitals should be upgraded in the 8th plan.

3. Primary Health Centres : Decentralisation of health care system is a vital part of its functioning. As a consequence there are 23 primary health centres these are evenly distributed in the various districts. There are 7 PHCs in East, seven in West, three in North and six in South.

Each centre covers 10,000 to 20,000 population. All the PHCs except two have electricity in the premises and telephone facility is available only in Jorethang PHC. All the PHCs have bed strength of 10 beds. Seventeen out of 23 PHCs are housed in government buildings and three are in rented building and other 3 have been sanctioned recently.

Sub-Centres :- Sub-centres are the part of the distributional aspect of health system. There are 6.7 sub-centres (PHSCs) under each primary health centre. There are 142 PHSCs in the state and each covers a population of 1600 to 3000 approximately. Sixty three of the 142 PHSCs have residential quarters for ANMS, MPWS and IV staff.

Table - 1 : Health Infrastructure in Sikkim <sup>1</sup>

<i>Items</i>	<i>North</i>	<i>South</i>	<i>East</i>	<i>West</i>	<i>Sikkim</i>
1. Hospitals	1	1	2	1	5
2. PHCs	3	6	7	7	23
3. PHSCs	19	37	45	40	141
4. Beds available	80	160	445	110	665
5. Patients treated					
(a) Indoor	2125	1703	6268	2141	12237
(b) Outdoor	42495	52932	52355	68081	21563
6. ICDS centre	56	100	126	98	380

*Source : Health Department, Govt. of Sikkim.*

The above table depicts that the number of population per PHC and PHSC are highest and lowest in East and North district respectively. This variation occurs due to the variation in population density in the respective districts.

Integrated child Development Scheme : ICDS is centred in all the districts. There are 405 sanctioned ICDS projects, out of them 375 are functioning in 1990.

Table - 2 : Districtwise ICDS Centres <sup>2</sup>

<i>District</i>	<i>Sanctioned</i>	<i>In working position</i>
East	130	127
West	100	93
North	75	58
South	100	97
Total	450	375

*Source : Health Department, Govt. of Sikkim.*

**Health Guides :** Health guides are playing a vital role in the state health care system. Its district wise distribution is as follows :-

Table - 3 : Health guide distribution <sup>3</sup>

<i>District</i>	<i>Male</i>	<i>Female</i>	<i>Total</i>
East	45	27	72
West	41	8	59
North	46	5	51
South	51	10	61
Total	183	60	243

*Source : Health Department, Govt. of Sikkim.*

There are total 243 health guides in the state during 1990, comprising 183 male and 60 female. Staffing pattern of PHCs is similar to that recommended by Govt. of India. Two medical officers have been sanctioned for every PHC. Ten

PHCs have been sanctioned 3 medical officers. All PHCs have vehicles and 80% possess an ambulance. There are also ANM Training School and the school is affiliated to West Bengal Nursing Council and is admitting about 28 students per year.

**(ii) National Health Programmes :** All health programmes instituted by Govt. of India are implemented in Sikkim. Goitre is endemic in the state with a very high prevalence. Under the goitre control programme the sale of non-iodized salt has been banned in the state and a research centre has been established at Namchi for diagnosis, treatment and research in iodine deficiency disorders. Although leprosy is not a big health problem, a 20 bedded temporary hospitalisation ward has been established in Tadong in East district. A bunch of new programmes have been identified for implementation during the 8th plan period. These are :

(i) National Mental Health Programme (ii) Control of AIDs (iii) Cancer Control (iv) Dental Health (v) Diarrhoeal Disease Control Programme (vi) A.R.I. Control Programme.

### **Social Welfare Programmes for Women and Children :**

Social scientists have recognised that in all spheres of life women are discriminated against and their accessibility to various welfare services such as education, health, employment etc. is far less than their male counterparts. The situation is very worse in the remote areas of rural Sikkim. Mortality and morbidity are perhaps much higher among females resulting in a continuous decline in the sex ratio. In this consequence the state has initiated a number of social welfare programmes, aiming at the improvement of the lot of the women and children, the physically handicapped, the aged and the weaker section of the society.

A social welfare wing was established in 1976 and this wing was brought under the department of Health in 1985. The activities of the social welfare wing are as follows in Sikkim :

**(i) Distitute homes :** There are four distitute homes being run by voluntary agencies/social welfare wing with Grant-in-aid from the Govt. of Sikkim. They are situated at Chakung, Kaluk, Pelling and Gangtok. Each of these homes cater for 50-100 children.

**(ii) Creches :** There are 65 creches all over Sikkim. These are run by various voluntary agencies under the supervision of state social Advisory board. Ninety per cent of the cost for running these creches is being given by central social Welfare Board, New Delhi and the remaining 10% is given by the state. **(iii) Day Care Centres :** There are two day care centres being run in Gangtok and Pelling by Sikkim Women's Council and D.L.Y.T.

**Welfare Scheme for Women :** This scheme include the following **(i) Working women's Hostel :** A hostel with a capacity of 90 women is being run by social welfare wing, Govt. of Sikkim. Another hostels has been built at Namchi and would be run by the Sikkim Women's council. It also proposed to build one more hostel at Gaylshing **(ii) Training of Rural women for income generation:** Participation in economic acitivity is a crucial component of human development. Proper training could improve their social position. Viewing this point, training Centres are established in the following places and the emphasis was given in the traditional knitting, tailoring and embroidery sector. The centres are distributed in the following places : (a) Turuk (b) Ranipal (c) Tibet Road, Gangtok (d) Arithang, Gangtok (e) Gyalshing (f) Pelling. These centres are run by various women's organisations with the grant-in-aid from the state government. **(iii) Training Cum Production Centres :** The Arithang social Welfare Association runs such a centre at Arithang, Gangtok. Another such centre is run at Gyalshing by a local Women's organisation.

**Welfare schemes for Physically Handicapped :** A number of welfare schemes have been instituted for hanidcapped men, women and children by the state. Of them **(a) Stipend/scholarship :** Stipend Rs. 150 is given to blind, deaf and dumb for their education in special institutions outside Sikkim. They are also trained in professional courses like teaching, physiotherapy, music/dramatics. Scholarships

are also provided to disabled children studying in general schools from class I to XII. (b) Sheltered Workshops : Handicapped children are trained in spinning, cane, and bamboo work, candle and chalk-making etc. (c) Supply of Aids and appliances : Various appliances like crutches, wheel chairs, hearing aids, callipers, folding stick etc. are supplied to needy persons free of cost, spectacles are also provided free of cost to the poor patients.

### **Growth of the Health Infrastructure :**

Since merger with India, Sikkim has experienced a multi-dimensional transformation in all facets of the state. The basic infrastructure of health and its growth from 1975 depicts the true picture of its achievement in health facilities.

Table - 4 : Health infrastructure in Sikkim <sup>5</sup>

<i>Year (0)</i>	<i>No. of dist. hospital</i>	<i>PHC</i>	<i>PHSC</i>	<i>No. of beds</i>
1975-76	5	-	26	337
1979-80	5	15	32	628
1984-85	5	18	82	705
1989-90	5	20	132	795
1990-91	5	22	136	795
1991-92	5	23	141	975

*Source : Health Department, Govt. of Sikkim Gangtok.*

The health status in Sikkim reveals a clear picture of improvement from the following figures :

Table - 5 : Patients and Beds <sup>6</sup>

<i>District</i>	<i>Beds available</i>		<i>Indoor</i>		<i>Outdoor</i>	
	<i>in no.</i>					
<i>Year</i>	<i>79-80</i>	<i>91-92</i>	<i>79-80</i>	<i>91-92</i>	<i>79-80</i>	<i>91-92</i>
East	380	445	4817	6268	98085	152355
West	90	110	1576	2141	50114	68081
North	70	80	1673	2125	31456	42495
South	90	160	862	1703	27792	52932

Table - 6 : Registered Health Personnel <sup>7</sup>

<i>Type(Year)</i>	<i>79-80</i>	<i>91-92</i>
Doctors	35	123
ANMs	109	348
Staff Nurse	5	25

*Source : Sikkim : A Statistical Profile. 1979-92 Planning a Development Deptt.*

Table - 7 Growth of ICDS Centre<sup>8</sup>

## Growth of ICDS Centre

District	1979-1980	1991-1992
East	75	126
West	75	100
North	71	56
South	75	100

*Source : Sikkim :- A statistical profile- 1979-92*

Traditional health care (Jhankri) and Ayurvedic institution. There is one Ayurvedic institution with 10 beds and four doctors and one nurse and it has treated total 7128 patients.

### **Family Welfare Programme :**

National Family Welfare Programme is being implemented in Sikkim since 1976-77. It is fully centrally sponsored programme although the programmes is in existence in India since 1951. The motto of the programme has been to implement as people's programme. Practically the family welfare programme is a composite package which includes control of birth rate, maternal and child health and immunization. The health infrastructure of Sikkim is mentioned detail in our previous section. Mass education, media activities, social consciousness and adult literacy are being taken regularly in order to educate the couple to adopt small and healthy family norms. The quality of life largely depends on these factors.

The long terms demographic goals laid down in the National Health Policy is to achieve birth rate of 21/1000, death rate of 9/1000. Natural growth rate of 1.2%, infant mortality rate of 60/thousand live birth and 60 per cent couple protection rate of 2000 A.D. However the state has achieved as on 1990 birth rate

of 26.4/1000, death rate of 7.3/1000, infant mortality rate of 96/1000 and couple protection rate of 20.6% and growth rate of 1.91. This reveals that the target laid down in National Health Policy may not be achievable specially because of low couple protection rate.

The family welfare programme was implemented in the state only after 1976-77.

The programme as implemented in the state of Sikkim at different level as follows :

**(a) State Family Welfare Bureau** : To monitor the whole functioning of the Welfare Programme, State Family Welfare bureau is formed under the Directorate of Health and Family Welfare. Secretary, Health.

**(b) District Family Welfare Bureau** : District Family Welfare is started functioning very recently. It is yet cover in all districts of Sikkim. In the East district, the Centre is functioning at singtam, headed by District Family Welfare Officer. In West, South and North Districts no Bureau has been sanctioned.

**(c) Rural Family Welfare Centre at Primary Health Centre Level:** There are total 23 PHCs in the whole state of only seven PHCs are provided with rural family welfare centre. Rural area is inaccessible and stiff terai restricts the mobility of the facilities. The facilities to be extended in all PHCs to eradicate and uplift the barriers and the standard of living of the rural people.

**(d) Post Partum Programme** : Under this programme, State is running lone District level Post Partum centre at the state headquarter, Gangtok attached with urban Family Welfare Centre. Two districts of West and South had been implemented with sub-district level post partum units.

**(e) Universal Immunization Programme:** Universal Immunization Programme launched by Government of india in 1985 headed by State E.P.I officer and was extended to the East district of Sikkim in 1986-87 and in the rest of the districts in 1986-87. The focus of attention being infant and pregnant women with a goal to achieve 85% coverage of infants with B.C.G, Measles vaccination three

doses of DPT and OPV and 100% immunization of pregnant women with doses of T.T vaccine by 1990.

There are various reasons for short fall in the coverage of pregnant women. The reasons are reviewed from time to time and some important reasons are: (i) Difficult in identifying the pregnant women due to inaccessibility of both health personnel as well as pregnant women to avail services, (ii) Lack of information and awareness of benefit of immunization of women during pregnancy (iii) Cold chain system : The success of the programme depends on maintenance of efficient cold chain system. The state has well developed this system with generators provided for each PHCs to use during power failure.

**(f) Research and Training :** Research & Training is an essential part of the medical or health care system. State is having one ANM Training centre headed by Principal Nursing officer with capacity of training 40 trainees yearly.

**(g) Transport :** There are 23 vehicles available under Family Welfare. more vehicles are required to meet the communication system more compact.

**(h) Training at Indigenous dias :** Target of 50 dias per year have been set for the state training. We have already trained 321 women from villages in 1993.

**(i) Village Health Guide Services :** Presently 237 village health guides are working in different villages.

#### **National Leprosy Eradication Programme in Sikkim :**

The National Leprosy Eradication programme was launched in Sikkim from 1976 and the programme was projected then as the National Leprosy Control programme. During 1981 and onwards it became a hundred per cent sponsored scheme reframed as National Leprosy Eradication Programme, aiming total eradication of the disease from the country by 2000 A.D. Initially the programme was started by a medical officer I/C Leprosy unit. The unit was established in all four districts.

## Infrastructure of the State leprosy Programme :-

### 1. Line of control

- (i) D.H.S.
- (ii) jt.D.H.S.(cd) District Level
- (iii) Programme Officer Mid Level
- (iv) Medical officer District Level(ULC)
- (v) N.M.S, U.L.A.& P.A.W.

### 2. Physical Infrastructure

No

- (i) Leproy control Unit (L.E.C.) 1
- (ii) Urban Leprosy Centre (U.L.CL) 4
- (iii) Survey Education Treatment (S.E.T.) 21
- (iv) Temporary Hospitalization Ward (T.H.W) 1

### 3. Staffing Pattern

There are total of 75 staff under NLEP programme recently. Out of them, the main functions of NLEP is case detection, screening alongwith temporary hospitalization and lastly bacterial examination. NLEP is an essential part of the health care system. Yet it faces so many drawbacks. These are of two fold. Firstly structural pattern is sufficient as prescribed by the Central government. There is lack of sample Survey Assessment unit, Reconstructive Surgery unit and Leprosy Rehabilitative Promotion unit. Therefore, the infrastructure existing in the state is lagging behind the central rule.

Expect this it also run through functional problems. Firstly there is no District Leprosy officers in any one of the district. Secondly there is a requirement one medical officer for every Leprosy Cure Unit. Due to the shortage the appointment is delayed or deferred. Thirdly there is no proper staff at G.B.Pant Hospital.

Table - 8 (a) National Leprosy Eradication programme

Year	New cases detection			Case discharged		
	Target	Achieved	%	Target	Achieved	%
1990-91	80	33	41.2	50	3	6
1991-92	50	27	54.0	100	19	19
1992-93	50	36	72.0	100	10	10

*Source: Health Department, Govt. of Sikkim, Gangtok.*

The table : 8 depicts a poor performance and achievement. The case detection per cent increases but the physical achievement and case discharged proved only the existence of NLEP.

### **School Health Programme :**

The school health programme has a wider outlook to the improve the quality of life in future as well as present. The objective is to prepare younger generation to adopt measures to remain healthy and utilize educational facilities to widen the social consciousness and serve their families and community at large. This programme was initiated in 1977 and the facilities were provided to school children from class I to V. It includes Medical check up, Immunization, school Health Education and Teachers Training. Urban School Health Unit is based at S.T,N.M. Hospital and in the districts. District Health Education Officer and PHC team are providing such services. School Health Education is provided from District in the form Health talks, Quiz, Essay Competition and mini exhibition.

**Main Problems :-** (i) There is no separate infra-structure for school Health Programme in the Districts. (ii) There is no medical officer under school Health Programme in Districts which amounts to variation in coverage. (iii) There is lack of fund in promoting the programme effectively. (iv) Sikkim is a hilly state. So communication is a major blockade and there is no adequate vehicle to monitor the programme.

Table - 8 (b) School Health Programme

Academic Year	Estimated schools	Coverage (%)	Beneficiaries	Training of teacher
1990	450	333 (74)	20,343	83
1991	450	340 (75)	12,394	85
1992	450	345 (76)	25,808	81

*Sorce : Health Department, Govt. of Sikkim.*

**Special campaigns organised :** (i) Diarrhoeal diseases (ii) Population Education (iii) AIDS (iv) Durgs (v) Nutrition (vi) Personal hygiene/sanitation (vii) communicable diseases. The joint training is the programme mainly to reoriented the Health workers (male and female), Anganwadi on the different kind of diseases and its prevention. During 1990-92, the following programmes were organised. These are (i) Health camps 196 (ii) Film show 200 (iii) Exhibition 309 (iv) O.T.C. 41 (v) Drama competition 4 (vi) Quiz competition 8 (vii) Panchayat Camp 41 (viii) Joint Training 80 (ix) Seminar 14.

**(iii) Social custom & belief :**

The human development condition in Sikkim state is directly related to the ecology, human settlements, economic pursuits and amenities available. The quality

of life is largely depends on the economic, social as well as political atmosphere of the region. It is well accepted that development should be matched with human need and well-being. Well-being has physical, mental, ethical, socio-economic, political and ecological dimensions.

The state of health in population groups of Sikkim has been affected by ecological and socio-cultural factors like climate, terrain, isolation, belief and poverty. The factors affecting the health of these population groups can be divided into two categories :- those factors which are responsible for spreading diseases in the people; those factors which affect the health of the people in an indirect ways. The factors which are responsible for producing disease are (i) settlement pattern and state of cleanliness; (ii) personal hygiene; (iii) consumption pattern; and (iv) addiction. Factors which affect health indirectly are (i) religion and family outlook on health; and (ii) health care system -

**Religion and Family outlook :-** Religion has been held responsible for many differences and norms affecting the fundamental values and behavioural patterns in life including health behaviour. In Sikkim, Lamaism, Hinduism and Animism are practised by different ethnic groups, but it is very difficult to classify them accurately. Some Nepalese are Hindus and others are Buddhists, while the Lepchas are animists and Buddhists. The religion of the scheduled castes is uncertain, although they have been classified as Hindus. There is no proper demarcation between Hindu and Buddhist sect. Even the Brahman joins with other peasants, both Hindus and Buddhists in making regular contributions to the Buddhists monasteries in order that the Lamas may protect his crops from hails.

Lepchas are the original inhabitants of the state. Among the Lepchas, the conception of gods is vague, and apparently, it had not attained maturity when it was superseded by Buddhism. The primitive religion was dominated by the concept Bon thing, who might be called a shamar, a medicine man.

For the Lepchas, illness is something that may be caused by spirits of envy, hatred and quarrelling. Illness may be prevented by leading a good clean life and not causing trouble of others. The Bhutias, on the other hand, believe in witchcraft

and sorecery. Their belief in witchcraft and soreery offers a possible contrast between the scientific and cultural reality. They believe that they have at least partially solved the problem and their partial solution contributes a great deal towards the shape of the Bhutia cultural system.

The Lepchas believed in two types of spirits - (i) good spirits Rum and (ii) evil spirits - Mung. It is impossible for an ordinary men to deal directly with the spirit world and to know the exact cause of their trouble. When a man is ill, a Bonthing is called who burns incense to know wheather it is Rum or the Muns who are troubling the sick persons. Then by counting the rosary and throwing the dice he discovers what is troubling the patient and sacrifices. In case of a sick woman a Mun is called. Mun is a woman who sings and calls up the Rum.

According to the Lepchas, the cause of human suffering is mainly due to supernatural intervention. Its explanation is entirely different from that of Lamaism. In Lamaism the cause of suffering is desire, physical need, sensuous desires and the natural tendency to develop attachments to things and persons. The Lepchas and Bhutias rituals primarily serve to insure that a person will have a long and healthy life and suffer few misfortunes. Both perform curing and purification rites and maintain similar beliefs about the supernatural and man's responsibility to it. The rites are held to produce a harmonious relationship between man and supernatural. They also serve as social occasions where a large numbers of people come together for conversation, drinking and general gaiety.

Illness and death are attributed to a number of malignant spirits who have to be propitiated by various ceremonies. A few of these super-natural beings like sang group Mung, there are also some benevolent supernatural beings like Kun Kung, the guardian spirit of life. The Bhutias of Lachen and Lachung are Buddhist and believe in basic principles of merit and sin. They also believe in a vast array of gods and spirits who must be propitiated at the appropriate time for general welfare of society.

Finally, village religion includes the primordial tradition of shamanism. The Pau's primary function is to cure illness. He goes into a tranee and

communicates with spirits in order to discover why they have afflicted the patient with illness and how to appease them. Sometimes he performs diagnosis with the help of a plate full of rice. He goes on shaking the rice plate till the symbol of the evil spirit appears in the plate. The Pau performs Phuphi by offering money, eggs and clothes which have been circulated thrice over the patients head to the malignant spirit. These things are thrown out and only cloths are brought back. It is believed that the person will get cured within three days. Only if he is not cured will he go to the Lama or the primary Health Centre.

Like the Bhutias, Sherpas are of Mahayana Buddhism sect, The Sherpas believe in a great number of malignant spirits. The Sherpas perform rituals to appease these spirits with aid of two types of ritual practitioners - the Lamas and the spirit media. Illness and other misfortunes are caused by the activities of Witches - Pem or Sondim. The shamans, village lamas and Lamas do similar curing rituals with similar structure, but shaman work is not considered as religious work. The shaman's primary function is to cure illness. He goes into a trance and communicates with spirits in order to discover why they have afflicted the patient with illness and what they require for leaving the patient.

The Tamangs also belongs to Mahayana Buddhism and like other Bhuddhist groups believe in numerous evil spirits. These spirits are considered the cause of illness among humans. They practice Jhankrism. Jhankrism in its original form is a kind of shamanistic cult. The Tamangs call their Jhankri (shaman) priest their Bompo. He drives away the spirits when people fall ill. He worships and sacrifices animals.

The next group is Newars. The Newars also practices Jhankrism. The Jhankris are called in case of illness and spirits and are considered as the cause of illness.

All Nepali groups, the Brahmans, Chhetris, Rais, Limboos, Managars, Gurungs and scheduled castes are Hindus. Jhankrism is not peculiar to anyone Nepali group but is found among all of them.

Among the Rais, the religious leader who presides over ceremonies is called Ngopa. He becomes possessed by spirits and announces the verdicts of the gods. The Ngopa also acts as a physician and tracts the people by propitiating gods and spirits during an illness.

The Limboo (Subba) community is closely related to the Rai community in that it has a number of local deities of mountain and rivers to worship. The Limboos have two different kind of religious leaders known as the Shamba and the Fedangba. Either of these can conduct rituals on behalf of their clients to ward off evil spirits and treat their clients when they fall ill. The Mangars are Hindus and have Brahman priests who lead them in the same pattern of religion as practised by the Brahman - Chhetris. Like the Mangars, the Gurungs have Ghyabre priests to ward off evils and perform purificatory rites. The religion of the scheduled castes is uncertain but their beliefs regarding health, illness and spirits possession are other Nepali groups. They believe in the Jhankris and send for their help in case of illness etc.

#### **(iv) Health care system in Sikkim :**

A health care system is concerned with the ways and means in which people organise themselves to take care of the patient. These different categories of illness are treated accordingly. Diseases caused by supernatural beings are treated with worship and devotion accompanied by animal sacrifice. Diseases caused by magical means are treated by erocism. These system involve rituals, the medicineman or exorcist and the patient.

The concept of health and hygiene among the people of Sikkim is not very high. The drainage system is extremely poor and at places animals and human beings live side by side, there are no preventive health care measures as such which are taken by population groups to avoid illness. The only preventive measures being taken by them are periodic village and family rituals towards of evil spirits.

The majority of the people in Sikkim has no idea about the causation or preventive of diseases. The belief in the interference of a supernatural agency is

very strong in the context of health and diseases. Different spirits and deities are believed to be connected with different types of diseases. All deities have their own respective departments and area of influence, effect and control as well as nature of actions. However, they have started to realise the efficacy of scientific method of treatments and prevention and evidence by their ready acceptance of the small-pox vaccination.

The state of personal hygiene was found to be very poor almost all the population groups of Sikkim. In this respect the Lepchas and the Bhutias were the dirtiest. The Nepalese on the other hand, take more frequent baths, but they are otherwise no better. Most of them are extremely reluctant to change and clean their clothes; wash their hands, mouth and teeth, and to clean themselves after defecation. This state of bad personal hygiene for which the climatic conditions and difficulties in procuring may be partly responsible, has greatly contributed to the wide spread prevalence of pediculosis, worm infestation, skin diseases including scabies, dental troubles like caries, Pyorrhoea etc. found amongst them. The majority of the people also go without any footwear. Because of cold climatic conditions the people of Sikkim always sleep inside the house and due to the shortage of space, close to each other. In such a situation, coupled with low frequency of bathing, washing and changing of clothes, louse infestation is prevalent. Lice are known to be carriers of epidemic typhus and relapsing fever.

### **Health Scenario in Sikkim :**

A cross section and time series analysis of the health infrastructure and investment of Sikkim is given here. The comparison is made with Kerala, which is regarded as the demographic laboratory of India, not only this, it also occupies the highest human development index among Indian major states. The per capita Net state domestic product i.e. per capita income is low in comparison to 17 major states in India. But Kerala's achievements are quite high and exceptional. The HDI for Kerala is 0.651 in 1987. (11) As consequence the achievement of Sikkim is compared with Kerala and beside this all India figures are given to make the matter

more comprehensive and more significant. We are discussing one after another.

(i) Hospitals : Hospitals are inseparable and the most ingredient part of health factor. The total number of hospitals per one lakh population is given here:<sup>12</sup>

Table - 9 Hospitals/Lakh pop. : Comparison growth

<i>Total (yr)</i>	<i>1976</i>	<i>1981</i>	<i>1986</i>	<i>1988</i>	<i>1991</i>
Sikkim	1.90	1.58	1.39	1.32	1.24
India	0.72	0.99	1.02	1.25	1.32
Kerala	2.52	2.98	1.20	7.35	7.02

*Source : Annual Report, 1991-92, Ministry of Rural Development.*

During 1976, there were 1.90 hospitals per lakh population which declined at 1.24 in 1981; whereas the Indian number was doubled during the same period. In case of Kerala, the matter is completely different. During the period 1976-91, the number of hospitals per lakh population was tripled which is a major achievement of the state. It is possible due to low population growth and improved vital indicator where as in Sikkim, the growth rate of population is very high and the stagnant condition of basic health programme. So in terms of hospital, the plight of Sikkim is lower than National average and nearly six times lower than Kerala in 1991.

(ii) **Beds** : Number of beds per lakh population is shown here.<sup>13</sup>

Table - 10 (a)

<i>Year</i>	<i>1976</i>	<i>1981</i>	<i>1986</i>	<i>1988</i>	<i>1991</i>
Sikkim	145.18	135.28	145.83	139	130.08
India	72.79	73.64	77.79	78.19	78.70
Kerala	225.4	175.92	220.15	266.56	263.20

*Source : Annual Report, Ministry of Rural Development.*

It is evident from the above table that the number of beds/lakh population has increased in both cases of Kerala and India; Whereas the numbers had declined from 145.18 in 1976 to 130.08 in 1991. It reveals a poor development of indoor facilities. Sikkim occupies 130.08 beds/lakh pop. which is nearly double in Kerala in 1991, but the state of Sikkim is undoubtedly better in comparison to national average from the very beginning.

Table - 10 (b)

Sikkim 1993

Districtwise availability of beds/lakh <sup>14</sup>

<i>No. of beds</i>	<i>North</i>	<i>East</i>	<i>South</i>	<i>West</i>	<i>State</i>
lakh pop.	256.08	249.36	162.26	122.25	198.05

*Source : Sikkim at a glance 1993, B.E.S.*

The districtwise variation in 1993 in Sikkim shows that the north district occupies a better position in terms of per capita availability of bed/lakh population. But the real picture is completely different the nature and morphological setting of

North Sikkim, especially the existence of La-chen and La-chung valley settlement, restricts the availability of hospital and bed facilities. Traditional mixed farming, herding and variation of settlement are very frequent in their life style and after all the lack of awareness and belief on traditional treatment restricts the benefits.

**Dispensaries** : The number of dispensaries per one lakh population. Inaccessibility and lack of proper transportation and communication are twin causes of health hazards in Sikkim. So the dispensaries play a significant role in rearing up the health condition of local people. It provides medicine and primary health care measures.<sup>15</sup>

Table - 11

Year	1976	1981	1986	1988	1991
Sikkim	9.12	1.90	N.A.	32.32	33.45
India	1.09	2.45	3.38	3.67	3.25
Kerala	2.77	2.95	5.48	7.51	6.04

*Source : Annual Report; Ministry of Rural Development.*

It depicts that the relative position of Sikkim in terms of dispensaries is better than National average, i.e. 1.09 and even better than Kerala in 1976. But during 1981, the state of Sikkim is worse, it stands at 1.09, a sharp decline from 9.12 dis/lakh population. This decline is due to havoc population increase and inelasticity in dispensary expansion.

It can be seen from the table that medical facilities in terms of dispensaries available in Sikkim is even highest. It accounts for 33.45 dispensaries/lakh which is nearly 11 times more than national average and about 5 times more than Kerala. This is possible due to havoc investment during the last decade. Yet it is interesting to note that the health condition of Sikkim is far below than Kerala. It implies that the dispensaries are not functioning properly and the mass participation is also lack. Due to the shortage of man-power, requisite medical stock and the traditional

way of life hinders the functioning of these dispensaries. It is found that the dispensaries, specially in rural areas remain closed in most of the days and it opens occasionally.

### **Primary Health Centres (PHC) and Sub-centres (PHSC) :**

The activities of the primary health centres and sub-centres are very crucial in Indian health care system. The total number of PHC's and PHSC's are given earlier. In terms of PHCS, Sikkim is always in a better of position, at least statistically. It is evident from the account that per lakh population have PHC facilities of 2.20 in Sikkim during 1975 which is nearly thrice more than Kerāla and it is twice than national average. Even, during 1991, the number of PHC per lakh population is 5.97 which is also more than national average and Kerala. It is very interesting to note that although, statistically, the situation is better but practically, the facilities are limited to a certain area, due to the hilly hazards, bitter climatic condition and inaccessibility. <sup>16</sup>

Table - 12

<i>Year</i>		<i>1976</i>	<i>1981</i>	<i>1986</i>	<i>1988</i>	<i>1991</i>
Sikkim	PHC	2.20	5.65	6.31	5.92	5.97
	PHSC	9.66	11.31	29.35	37.33	37.18
India	PHC	1.11	1.06	2.45	2.81	3.55
	PHSC	7.87	9.74	17.18	18.77	20.90
Kerala	PHC	0.85	0.70	2.08	2.77	4.27
	PHSC	9.27	8.75	15.72	18.31	23.45

*Source : Annual Report 1991-92, Ministry of Rural Devp.*

Primary health sub-centres work as a supplementary to PHCS in Sikkim. The growth of PHSC's is impressive. During 1976 it was 9.66 which raised at 37.1 in 1991. The number PHSCs per lakh population is 23.45 in Kerala and it is 20.09 in Indian average. At the very beginning, the plight of Sikkim was also better than national average and Kerala, the respective rates were 9.66, 7.87 and 9.27 in 1976. The functioning pattern is mentioned earlier. With all this effort, the achievement of Sikkim is far behind than Kerala; this is due to the fact that Kerala is progressing gradually from earlier independence whereas Sikkim merged India in 1975 and due to political and other reasons, a huge amount of investment was made towards social sector and social welfare to boost up the condition of human and humane.

Table - 13 Doctors & Nurse<sup>17</sup>

		1971	1981	1991
Sikkim	Doctors			29.67
	Nurses			
India	Doctors	27.57	39.22	47.19
	Nurses	14.71	21.95	36.88
Kerala	Doctors	27.09	45.95	56.72
	Nurses	19.43	37.48	78.41

*Source : Annual Report 1991-92*

Doctors and Nurses : Besides hospitals and patients, the doctors and nurses are regarded as the another two wheels of a mobile vehicle. There is also scarcity of doctor in Sikkim. Traditional treatment is more popular and affordable. The highly qualified doctors and even M.B.B.S do not want to practice in Sikkim. They always prefer Gangtok and the outside of Sikkim. Consequently the number

of doctors and nurses are very poor per lakh population. It ranks far below the national level. The plight of Kerala is better in this respect. Hence districtwise classification reveals that West is the Worst of all. The number of doctor per lakh population is only 15.28, but only the East district is in better position, it accounts for 42.58 doctors per lakh population. The transport communication and urban population are more in East district and the population is also maximum here. Consequently most of the doctors are concentrated at urban areas. Specially Gangtok and other centres. In villages the condition is very bleak. Inaccessibility and lack proper amenities generally do the doctors settle at urban areas. North, West and South district provides non-proportionate doctors and nurse. It is very hard to find in need.

Table - 14 Districtwise distribution

	<i>North</i>	<i>East</i>	<i>South</i>	<i>West</i>
Sikkim	22.40	42.58	23.33	15.28

### **Revenue Expenditure :**

The revenue expenditure pattern of Sikkim shows a faster increasing trend. During merger, the amount accounted for Rs. 4.55 million which jumped to Rs. 12.79 million i.e. 3 times more than 1975-76. After an interval of five years, the amount of the expenditure stood at Rs. 37.47 million which was simply three times more than previous 1980-81 expenditure amount.

Table - 15 Revenue Expenditure (in million Rs.)<sup>18</sup>

	1975-76	80-81	85-86	91-92	92-93	93-94	94-95
Sikkim	4.56	12.79	37.47	95.72	122.31	122.02	145.80

It is seen that during 1991-92, the amount reached at Rs. 95.72 million. This is two and half times more than previous. During 1992-93, 93-94 and 1994-95, the amounts were Rs. 122.31 million, Rs. 122.02 and 145.8 million respectively. It is observed that the growth rate during this period was not very high as it was in the last decade, although the expenditure amount is very impressive in respect of total population of Sikkim, nearly four lakhs.

### **Percentage of total government expenditure on health :**

In India, 3.49 per cent of total government expenditure is appropriated to health sector in 1975-76. In Kerala, 9.51 per cent of the total state government expenditure is utilised in the health sector, where as in Sikkim, only 4.98 per cent of the total state government expenditure is used as health expenditure. The geographical location and morphological situation need more amount of money to tackle the health problem in Sikkim in comparison to other parts of plain lands in India. If we observe closely, then it is very clean, that the state's contribution to the health sector is increasing gradually cover time and it stood at 6.78 per cent in 1994-95. The overall growth rate is 36.14 per cent in percentage distribution. From 1975-76 to 1991-92 , the percentage growth rate on expenditure was 20.68 per cent which less than overall 1994-95.

Table - 16<sup>19</sup>

<i>Year</i>	<i>1975-76</i>	<i>80-81</i>	<i>85-86</i>	<i>91-92</i>	<i>92-93</i>	<i>93-94</i>	<i>94-95</i>
Sikkim	4.98	4.17	4.83	6.01	6.81	6.10	6.78
India	3.49	3.29	3.29	3.11	2.71	2.71	2.63
kerala	9.51	8.55	7.85	6.92	6.29	7.13	7.44

*Source : Annual Report 1991-92, Ministry of Rural Development, Govt. of India.*

The trend is declining over time and the percentage of reduction is 24-64 which is very insignificant for a welfare state. The rate of reduction of percentage of total state government expenditure on health is 21.76 per cent in Kerala over the period and this rate is lower than national average. Although the percentage is more than Sikkim i.e., 6.78 during 1994-95. Percentage of government expenditure towards health is a good indicator of human development effort also. It is evident from the table that the reduction process or curtailment in health expenditure was started from 1980-81 and this process is continuous upto 1994-95 at National level and for Kerala, but the percentage of Sikkim reduced for 1980-81 only; thereafter the growth rate of percentage was increased year after year. This is an exception. This implies that after merger (1975) a special care and consideration was taken to uplift and boost up the overall health condition of Sikkim. There may be some political and strategic reasons too.

#### **Per capita health expenditure :**

The cost and expenditure on health is general more in hill areas. It needs more amount of money in relation to plain areas. In sikkim, population is sparsely populated and the location of the health centres are on the slope of hills. So the per capita expenditure on health in Sikkim is naturally more than other areas. But one point is to be mentioned here that during 1975-76, the per capita expenditure was Rs. 17.54 which was more than national average and even Kerala and the amount was doubled during every five years onwards upto 1991-92. It is to be noted that after 1991-92. The growth rate was recorded 14.08 per cent up to 1994-95 which was slower than last decade.

Table - 17<sup>20</sup>

	1975-76	80-81	85-86	91-92	92-93	93-94	94-95
Sikkim	17.54	39.97	104.08	227.90	284.4	277.32	324.00
India	9.91	17.35	35.52	60.13	70.15	79.44	85.10
Kerala	14.43	22.43	41.64	75.43	76.86	103.77	122.07

*Source : Annual Report 1991-92, Govt. of India.*

The per capita health expenditure of Kerala is lower than Sikkim in 1994-95. The expenditure of Sikkim is almost three times more than Kerala and four times more than national average. This implies that a higher priority was given on Sikkim. Although the performance of the State is not upto mark; yet the government sanction is impressive. The per capita expenditure is significant in sikkim, but its appropriation and implementation is questionable. The mass involvement and mass mobilisation are very essential to raise the health programme more success. It is also to be estimated on the basis of cost benefit that how far this health expenditure translates human beings in raising human capabilities and enlarging their choices.

#### **(V) Morbidity Pattern :**

Human development largely depends on the quality of life as means and ends of development process. On the other hand; the quality of population can be evaluated from life expectancy, access to decent living income sources, the literacy and the technical training attained by the people of a state. The first and most important component of life indicator is life expectancy. Life expectancy depends on the incidence of mortality rates e.g. infant and child mortality, and overall mortality rates, which in turn depends on a large number of factors, e.g. the occurrence of epidemics, the prevalence of diseases, the level of nutrition, the conditions of living, care of woman, infant mortality and the alcoholism and tobacco addition. The overall impact is reflected through infant mortality, child mortality

and overall incidence of mortality pattern on life which highly affects the life table structure and the expectation of life.

Morbidity (i.e. Sickness) pattern affects the mortality rate largely. In most of the small and backward states, there is no proper system of collecting and maintaining regular records of illness. But the illness pattern is very crucial in studying the health condition and severity of death pattern of a state. Morbidity pattern was studied mainly from primary and secondary sources.

**Primary sources :** Survey is the primary source. During survey, information was collected regarding the occurrence of some common diseases by questionnaire method. Information was collected in the following manner e.g. episodes of diarrhoea in last 30 days, cough of more than 15 days duration, having passed round worm and tape worm, measles, whooping cough and polio and identified tuberculosis. Data was analysed on the basis of age specific incidence and prevalence of these diseases have been estimated for various districts. During the survey, it is also noted about the treatment pattern and replacement to hospitals etc.

**Secondary data :** Secondary data was collected from the morbidity records of the different government publications and records of major hospitals. Most of the records are incomplete in many ways. Most of the government publications are overstated about the performance of health and hygiene. There is a huge difference from hard reality.

**Major diseases :** The major diseases which are prevalent in Sikkim are mainly acute respiratory infection, acute diarrhoeal diseases, pneumonia, Tuberculosis, worm infections and lastly viral hepatitis. In accordance with CMIE, the maximum no. of cases of diseases was recorded by Acute Respiratory infection. The total number of cases was 42218 and the number of death only one in 1992. Another major diseases is pneumonia. The total number of cases was 2295 and the total number of death was 3. Colder climate and excessive rainfall are two major causes. The highest number of death was recorded by Tuberculosis. Out of 991 patients, 25 patients died during 1992. Viral infections recorded a death of 6 persons

out of 592 infections during 1992. The severity of diseases can be observed from these records. Another major diseases which are prevalent in Sikkim, are measles, whooping cough, malaria, meningitis and gastrointestinal etc. Besides these, iodene deficiency and goitre are very common in Sikkim. Alongwith these malnutrition, low birth weight, anaemia and vomiting are very frequent occurrence among the Sikkimese.

Table - 18 Acute Respiratory Infections Diagnosis <sup>21</sup>

Year	OPD	Change OPD	IPD	Change IPD	Total
1990	47880	-	620	-	48500
1991	40751	14.88	703	+13.38	41454
1992	37371	8.29	973	+38.40	39344

*Source : Health Department, Govt. of Sikkim.*

Human Settlement Pattern and Housing in Sikkim are not congenial to health. The respiratory problems arises due to the lack of proper ventilation and hygienic consciousness, and the high altitude location of the settlement pattern of the population. Acute Respiratory infections are very frequent in Sikkim. It may be regarded as the major problem. The total number outdoor patients was 47880 and indoor patients was only 620 in 1990. The impact of this disease is prominent in Sikkim that during 1991 and 1992, the number of outdoor patient diagnosis has declined by 14.88 and 8.29 per cent respectively. This is possible mainly due to the expansion and good performance of the health department.

Although, the number of IPD has increased by 13.38 and 38.40 per cent respectively during 1991 & 1992. But the official estimation is far from the reality. The functions of the health department is only limited to urban centres and market places. So it requires a good net work as more developed transportation system to tackle the major health problem in Sikkim. In higher altitudes, the problem is more acute.

Table - 19 : Acute Diarrhoeal Diseases Diagnosis <sup>22</sup>

<i>Year</i>	<i>Outdoor patients</i>	<i>% change</i>	<i>Indoor patients</i>	<i>% change</i>	<i>Total</i>	<i>% change</i>
1990	41271	-	906	-	42177	-
1991	41708	+ 1.06	923	+ 1.87	42631	+ 1.07
1992	51925	+24.49	2131	+130.87	54056	+26.8

*Source : Health Department, Govt. of sikkim, Gangtok.*

The incidence of diarrhoea and dysentery are very high in Sikkim. The incidence are rising rapidly during the year 1990 to 1992. The severity of these diseases is more than other diseases of common nature. It needs immediate treatment and hospitalisation. These are largely water borne infections. Human settlement and water use pattern are twin causes behind this. In Sikkim, the common sources of water are rivers and small water falls. The water comes from upper layer of mountains but when it comes down from higher to lower altitude, it loses its quality. The water gets polluted by the insanitary human practice. The major causes are human waste, night soil, garbage and animal wastes etc. Consequently this water carries a large number of diseases, parasites and bacteria. This polluted water infects the digestive system of the people. On the other hand, the access of safe water is limited to urban areas only. As a result, the incidence of acute diarrhoeal diseases are very high in Sikkim. The total number of OPD was 41271 in 1990. It rose to 51925 in 1992. The increase per cent are 1.06 and 24.49 respectively in 1991 & 1992. In case of IPD, the increments are 1.87 and 130.87 respectively during 1991 & 1992 and overall showed the same trend.

Table - 20 Pneumonia Diagnosis <sup>23</sup>

<i>Year</i>	<i>Outdoor % change patients</i>		<i>Indoor % change patients</i>		<i>Total</i>	<i>% change</i>
1990	1983	-	449	-	2432	-
1991	1904	-3.98	396	-11.80	2273	-6.53
1992	1897	-0.37	242	-38.88	2193	-3.52

*Source : Health Department. Govt. of Sikkim.*

Cooler climate and rugged conditions of Sikkim influences the health condition. This cold climate and winter affects the people with infection of Pneumonia, bronchitis and bronchial asthma. Obviously Pneumonia is a cold prone disease. The incidence of Pneumonia is very frequent in Sikkim. It causes to several deaths in the state. During 1990 to 1992, the severity of disease is declining. The above figures implies that IPD declination is faster than OPD. The total no. of patient was 1983 in 1990 but it reduces to 1897 in 1992 and the respective declining rates are 3.98 and 0.37 per cent whereas the IPD reduction rates are 11.80 and 38.88 respectively in 1991 and 1992. And the overall declination is 6.53 and 3.52 respectively. Basic causes behind this decline is due to the increase in medical facilities in Sikkim during last decade. This implies that more people are brought under the medical net work. It also reflects the degree of control achieved on the incidence of disease through preventive and curative measures. The CMIE shows that out of 2295 pneumonia cases, only three deaths were recorded in 1992 but the above data shows that out of 2193 patients, the total number of death is seven in 1992. So it is below ten.

Table - 21 Tuberculosis Diagnosis <sup>24</sup>

<i>Year</i>	<i>Outdoor patients</i>	<i>% change</i>	<i>Indoor patients</i>	<i>% change</i>	<i>Total</i>	<i>% change</i>
1990	1502	-	517	-	2019	-
1991	685	-54.39	282	-45.45	967	-52.10
1992	416	-39.27	415	+47.16	831	-14.06

*Source : Health Department, Govt. of Sikkim, Gangtok.*

The incidence of tuberculosis is common in Sikkim. Besides this, other chest diseases e.g. bronchitis and asthma are also fairly common. The incidence of T.B was very high in past in Sikkim. But with the rapid expansion of medical facilities has brought down the number of patients. The climate of Sikkim is cooler. It needs more calorie to maintain the physical need of the people. But malnutrition is very common in Sikkim. Besides this, tobacco & alcohol consumption prevail largely in social life of Sikkimese. So pulmonary tuberculosis are caused due to chronic malnutrition, hard labour, absence of proper ventilation, the smoking & tobacco chewing habit and lastly alcoholic addiction of the people. It accentuates the probability of dying and reduces the expectation of life. The total OPD record is 1502 in 1990 and it reduces to only 0.416 in 1992. The corresponding decline rates are 54.39 and 39.27 respectively during 1991 and 1992. The IPD record is 517 in 1990 but it also reduces to 413 in 1992. The reduction rates are 45.45 and 47.16 respectively. The above figures depicts that out of 831 patients, 14 deaths was recorded. But the CMIE shows that out of 991 patients, the total number of death is 25 in 1992. Although there is a little difference in data but the incidence of T.B is proved to be very severe.

Table - 22 Viral hepatitis Diagnosis <sup>25</sup>

<i>Year</i>	<i>Outdoor patients</i>	<i>% change</i>	<i>Indoor patients</i>	<i>% change</i>	<i>Total</i>	<i>% change</i>
1990	497	-	79	-	576	-
1991	551	+10.86	122	+54.40	673	+16.94
1992	394	-28.49	174	+42.62	568	-15.60

*Source : Health Department. Govt. of Sikkim.*

The prevalence and incidence of viral infections are also very acute in Sikkim. The lack of proper hygienic condition and personal health causes viral infections. It is well-known that scabies, warts and other skin diseases are very common in Sikkimese. Due to cold climate & scarcity of water, the people are insanitary about their personal hygiene. They take bath rarely. The total number of patients was 576 in 1990 but it increases to 673, with an overall growth rate of 16.84 but during 1991-92, the total no. of patients declines from 673 to 568 i.e. at 15.60 per cent. It is also to be mentioned that out of 568 patients, the total number of death during 1992 was 4; but the CMIE indicates that out of 592 cases, the total number of death was 6 which is more than above figure. So the intensity of the disease can be realised easily from this two figures.

Table - 23 Measles Diagnosis <sup>26</sup>

<i>Year</i>	<i>OPD</i>	<i>% change</i>	<i>IPD</i>	<i>% change</i>	<i>Total</i>	<i>% change</i>
1990	311	-	80	-	391	-
1991	390	+25.40	74	-7.5	464	+18.67
1992	284	-27.18	60	+18.9	344	-25.86

*Source : Health Department, Govt. of Sikkim.*

Measles are infectious fever marked by red pustules. It is a disease of swine and cattle. Pigs and cattles are common domestic animal in Sikkim. The animals are kept inside the room except the pigs; but the cattle sheds are very near to the houses. The bathing and cleaning of the cattles are very common among them. The above records no death; but the CMIE records one death, out of 296 cases. Inhygienic condition is responsible for this. Pigs who live on extracts and garbage are major factor in the wide prevalence of this diseases. The trend show a declination in 1990-91 but it increases in 1991-92.

All other diseases diagnosis (excluding whooping cough and mentioned before) <sup>27</sup>

Table - 24

<i>Year</i>	<i>OPD</i>	<i>change</i>	<i>IPD</i>	<i>change</i>	<i>Total</i>	<i>Change</i>
1990	160902	-	5112	-	166014	-
1991	141873	-11.82	5374	+5.13	140367	-15.45
1992	174996	+23.34	7321	+36.23	182317	+29.88

*Source : Health Department, Govt. of Sikkim.*

Malaria, Kalazar are also very common among them. The incidence of goitre, hookworm and tapeworm are prominent in Sikkim. The prevalence of goitre appears to be very common in the Himalayan range. It occurs due to the deficiency of iodine in water. Iodized salt is the only preventive measre feasible. Hookworm is a parasite disease. The parasitic diseases are caused by the intake of raw or semi-boiled meat. The foods prepared from semi-decomposed carnions, not fully boiled, cause enteric disorders and worm infections. Of the blood diseases, anaemia deserves mention. The high incidence of hill diarrhoea and hill dysentry and chronic aliment from these disease lead to anaemia. It also causes due to malnutrition and worm infections. Cardiac diseases are also fairly common. Rheumatism is also present among people. Cold and rainy weather cause this disease. The high incidence

of helminthiasis (hook worm, tape worm and round worm) is normally attributed to poor hygienic conditions. The deficiency of vitamins are also very prominent among them. The other minor diseases are diptheria, whooping cough, jaundice, peptic ulcer, rabies, otitis media, epilepsy, congenital deformities etc.

All other category records 160902 OPD in 1990 which rises to 174996 in 1992. It reveals a growth rate of 23.34 per cent in 1992 but it declines in 1991 by 11.82 per cent. The IPD shows a positive growth rate of 5.13 and 36.23 per cent in 1991 and 1992 respectively. And out of 182317 patients, the total number of death is recorded at 128 persons in 1992.

Table - 25 Age and Sex specific prevalence of chronic cough more than 15 days duration <sup>28</sup>

<i>Age group</i>	<i>Male</i>		<i>Female</i>	
	<i>No. surveyed</i>	<i>No. with cough</i>	<i>Surveyed</i>	<i>No. with cough</i>
0-1	74	10 (135.1)	80	9 (112.5)
2-4	125	25 (192)	117	26(222.2)
5-14	481	31 (64.45)	473	28 (59.19)
15-49	1029	37 (35.9)	483	35 (41.51)
50-59	103	5 (48.54)	77	4 (51.94)
60+	70	7 (100.00)	56	6 (107.14)
Total	1882	115 (61.3)	1646	108 (65.7)

*Source : Enumerated from Personal Survey data.*

A total population of 3528 was surveyed in 1992-93. The age-sex specific occurrence of chronic cough are given here. It is evident that out of 1882 male population, the prevalence of chronic cough is 61.3 per cent. It also records that

the highest prevalence is observed among infants and children. Secondary data from all the hospitals and PHCs show that respiratory infections are the cause of highest morbidity in all over Sikkim. From the survey results, the prevalence of cough more than 15 days duration has been estimated age sex wise. An overall prevalence of 65.7 per 1000 population was recorded among females. The prevalence is prominent among 0-1 age group and above 50 years. The prevalence is 100/1000 population in male above 60 years and more 100 among females of this age group. The maximum prevalence is observed in 2-4 age groups i.e. 192 & 222.2 per 1000 children. The lowest prevalence was recorded in 15-49 age groups. It is evident from the figures that the female child prevalence is more than male child prevalence in the age group 2-4 years. But, prevalence is more among male infants than female. It implies that gender bias in family health care. Cold and damp weather and Tobacco & alcohol consumption are twin major causes of respiratory infections in Sikkim. It is evident from the account given by the health personnel that the people seek medical care only after the treatment of quacks (jhankri). The values and traditional values, regarding the diseases and their cure, bear a social pattern of treatment. Local medicines are also used. Only in cases of serious, prolongation of cough patients move towards dispensaries or nearest primary health centres. The means of communication and transportation are also obstacles towards expansion of medical facilities. Specially, coughs are not considered as serious disease at the prevalence period. Local medicines are used to cure them firstly.

Table - 26 Age and sex specific incidence of Diarrhoea during one month preceding survey <sup>29</sup>

<i>Age group</i>	<i>Male</i>		<i>Female</i>	
	<i>No. surveyed</i>	<i>No. with Diarrhoea</i>	<i>No. surveyed</i>	<i>No. with Dirrhoea</i>
0-1	74	12 (162.16)	80	13 (162.5)
2-4	125	28 (224)	117	30 (256.4)
5-14	481	44 (91.4)	473	34 (71.88)
15-49	1029	56 (54.42)	843	42 (49.82)
50-59	103	12 (116.5)	77	7 (90.9)
60 and above	70	13 (185.7)	56	11 (196.4)
Total	1882	165 (87.8)	1646	137 (83.2)

*Source : Calculated from Personal Survey data.*

Gastro intestinal infections form the second most common cause of morbidity in Sikkim. They include causes of diarrhoeal diseases, worm infestation and enteric infections. An overall prevalence of diarrhoeal cases in one month reference period is 85.60 per 1000 population. Male incidence of diarrhoea, i.e. 87.8 is more than female incidence, i.e. 83.2 in the surveyed population. Age-sex specific cases indicates that the highest prevalence is in 2-4 year age group i.e., 224 for male child and 256.4 for female child respectively. It follows 0-1 age group. The prevalence is less in the 15-49 age groups in both the sexes. The incidence of diarrhoea is more acute among female child. It is 256.4 which more than male, i.e. 224 per 1000 child of 2-4 years.

The overall incidence of diarrhoea among male and females estimate 87.8 and 83.2 per 1000 population during 1992-93. An overall record shows that male

prevalence is slighter more than female. Diarrhoea is mainly a water borne diseases. It arises due to lack of proper consciousness regarding personal health and environment. The access of safe water and raising of social consciousness through literacy are the major causes of acute condition of diarrhoea disease.

The food habit of the people largely affects the health condition. Particularly the consumption pattern of the people and cooking procedure. They take all types of meat e.g. pig, cow, beff, buffalo, yak and etc. Specially, pork is a favourite dish in Sikkim. These meats specially pork, beef and buffalo, carry the germ of hookworm, round worm and tape worm. In hill areas, normally water boils at a lower temperature i.e. below the boiling point 100 degree centigrade and the use of pressure cooker is very limited in Sikkim. The intake of raw meat (dried in the sun light) and semi-boiled meet are very common in Sikkim. Besides this, the carrions of pork & beef are preserved for future consumption. So the parasitic attack of round worm, hook worm and tape worm are very common in Sikkim. The survey results shows that worm infestation is very common in all districts of Sikkim. The prevalence of those who passed worm infestation is one month preceeding the survey was recorded. It is an oral estimation. It shows that the prevalence of worm varies 57.76 to 88.67 per 1000 population. The overall prevalence is 83.90 per cent. The North district shows the highest prevalence i.e. 88.67 per 1000 population. The geographical location of the North districts, i.e. high altitude and severe weather, is quite different. The main population composition, Bhutia & Lepcha are habituated in the traditional food consumption. The carrions of pork and beef are very favourite to them and pigs who live in the exereta and garbage are also major factor in the wide prevalence of the disease.

Table - 27 Districtwise prevalence of Round worm and Tape worm<sup>30</sup>

Age Group	East		West		South		North		Overall	
	No. Sur-veyed	No. Posi-tive								
0-1	60	5	43	1	38	2	13	3	154	11
2-4	88	18	68	12	64	15	22	15	242	60
5-14	360	32	260	24	254	22	80	10	954	88
15-49	695	34	548	15	475	28	172	27	1872	104
50-59	64	7	52	4	45	4	19	3	180	18
60 & above	50	6	33	2	31	5	12	2	126	15
Total	1317	102	1004	58	889	76	318	60	3528	296
		(77.44)		(57.76)		(88.48)		(88.67)		(83.90)

*Source : Enumerated from Personal Survey data.*

The incidence of worm is 85.48 per 1000 population which is second highest. The lowest incidence of worm is in the West district, i.e. 57.76 per cent. This variation largely depends on the human food habit and cooking and consumption pattern of the people. the spread of literacy and expansion of modern process of cooking and adoption of modern scientific cooking and food preserving systems are developing in few parts of Sikkim. Specially, in urban areas, although, the urban population is only 9 per cent in Sikkim. The urban centres and markets are limited. Consequently, people largely depends on old-aged religious and social culture of food preparation. The proportion of urban population are in more these districts. They are more conscious regarding this. The nature is less harsh.

An age specific picture of infection is given also. The incidence is highest

in the 5-14 and 15-49 age groups. The spread of literacy and social consciousness curtail the prevalence of worm in hill areas. Alteration of traditional food habits and the use of pressure cooker is another suggestive measures.

**Skin diseases :** The prevalence of skin diseases or infections are common in Sikkim. Scabies, warts and other skin diseases are dominant in Sikkim. Skin infections are regarded as the third common cause of illness or morbidity. They also include abcess, boils and dermatitis. The major causes are the cold climate and the scarcity of water. Besides these, the insanitary condition of the people about their personal hygiene is also responsible for it. Neglect of personal hygiene and cleanliness causes various infections and skin diseases.

**Eye infection :** Diseases of the eye e.g. conjunctivities, trachoma and senile cataract are also common. Night blindness is also available. It occurs due to the deficiency of vitamin A. Eye infection is the fourth common morbidity in Sikkim as recorded in Hospitals. Ear infection is also common. Hepatitis are also recorded in the hospitals.

**Iodine deficiency diseases :** The prevalence of iodine deficient diseases are very common in Sikkim. The high prevalence of goitre is observed among those over 51 years. The state suffers in hyper endemic goitre and other iodine deficiency disorders. So iodised salt is being supplied for the state since 1985 and the state government has launched a Thyroid centre at Namchi to prevent and cure, the iodine deficiency patients.

**Alcoholism :** Alcoholism is very common in Sikkim. Alcohol is freely available in all the districts of Sikkim. Sikkim breweries are famous for their products. Besides this, country made liquors are also very popular in Sikkim. It is a common believe that the use of alcohol increases the body activity permanently. In accordance with K.B. Roy (1979), "In fact, alcohol is not a stimulant. It depresses all vital organs. It does not stimulate intellect. It does not remove physical tiredness. It causes heat loss. Alcohol is not necessary for any normal human activity". In Sikkim, alcoholism is popular in both the sexes. In hill areas, people need more calories to survive but the traditional food habit pattern lacks proper nutritional

and caloric value in Sikkim. General diets and meals are below. The requirement level of the common people. They use to do hard work to survive. As a consequence the excessive use of alcoholism is injurious to health and responsible for the prevalence of disease. Not only percentages are given in the parenthesis this, the prevalence of other diseases e.g. Tuberculosis, peptic ulcer, gastric ulcer, liver damage etc. increase with the addiction of alcohol. Alcoholism with proper food and diet is very dangerous for life sustainability. It is evident from the population pyramid that above 60 years population is very low nearly 4 per cent in Sikkim. This percentage is lowest among all the states in India. It implies a high mortality rate before 60 years. So alcoholism indirectly reduces the expectation of life of the state also. A total population of 3528 was surveyed. The overall incidence of alcoholism is 34.04 per 1000 population in Sikkim. At age 15-24 years 42.49 per cent takes alcohol. At age 25-34 years 56.91 per cent population takes alcohol and in the subsequent age groups, the percentages are 62.23, 65.66 and 61.3 per cent respectively. It depicts that there is steep rise in alcohol consumption at the upper ages. At age 45-54 years highest, i.e. 65.66 per cent of the population addicted to alcohol.

Table - 28 Prevalence of Alcoholism among Survey Population<sup>31</sup>

<i>Age group</i>	<i>Total males</i>	<i>alcohol Addict- ion</i>	<i>Total Femal- es</i>	<i>Alcohol Addict- ion</i>	<i>Total surv- eyed</i>	<i>Total Addict- ion</i>
14 and below	680	15 (2.20)	670	12 (1.79)	1350	27 (2.00)
15-24	431	216 (50.12)	379	128 (33.77)	810	344 (42.49)
25-34	316	207 (65.50)	248	114 (45.96)	564	321 (56.91)
35-44	212	168 (79.24)	160	65 (40.62)	372	233 (62.23)
45-54	130	102 (78.46)	103	51 (49.51)	233	153 (65.66)
55 and above	113	68 (60.17)	86	54 (62.79)	199	122 (61.30)
Total	1882	776 (41.23)	1646	424 (25.76)	3528	1200 (34.04)

*Source : Calculated from Personal Survey data.*

Sex specific data reveals that the overall incidence of alcohol among male, i.e. 41.23 per cent which is more female per cent, i.e. 25.76. It starts at the early ages. At the age group 15-24 years, 50.12 per cent of males and 35.77 per cent females take alcohol. The highest prevalence of alcohol among female is 62.79

per cent in the 55 and above age group. Among the young females, the rate is 45.96. It increases the incidence of different kind of diseases among them and enhances the female mortality rate.

Among the male, at age 25-34 years 65.50 per cent of the total male population take alcohol and the rate increases in the subsequent ages. It touches, a maximum number 79.24 per cent in the 35-44 years age group. The prevalence of male mortality increases with the greater incidence of alcoholism.

Table - 29 Age and Sex Specific Prevalence of Smokers <sup>32</sup>

<i>Age group</i>	<i>Total male</i>	<i>No. of smokers</i>	<i>Total female</i>	<i>No. of smokers</i>	<i>Total population</i>	<i>No. of smokers</i>
14 and below	680	10	670	4	1350	14 (1.03)
15-24	431	121	379	26	810	147 (18.15)
25-34	316	103	248	68	564	171 (30.32)
35-44	212	111	160	63	372	174 (46.77)
45-54	130	56	103	35	233	91 (39.05)
55 and above	113	54	86	32	199	91 (45.72)
Total	1882	460 (24.42)	1646	228 (13.85)	3528	688 (19.50)

*Source : Enumerated from Personal Survey data.*

The addiction to tobacco is very common among the people of Sikkim. It is very popular in both the sexes and even among children, tobacco taking is very common. Cigarette & Bidi smoking are very popular smoking form of tobacco. Scientist have proved that smoking has a causal relationship to lung cancer and other cancers, cardia vascular diseases, respiratory diseases and gastro-duodenal ulcers etc. In Sikkim acute respiratory infections are the prime cause of morbidity. The prevalence of respiratory diseases are very common and harmful. So the intensity increases with the increase of more addiction to tobacco.

A study of Dhillon has shown that children born to parents, who are heavy smokers are more liable to chest diseases than the children of parent who do not smoke. The risk increases with the number of cigarettes smoked daily by pregnant women. Not only this the smokers pollute the near by environment and non-smokers badly. It leads to wide spread respiratory problem and the incidence of different diseases. Consequently, it would increase the mortality rate and lower down the human development process.

The survey results shows an overall incidence of 19.50 per cent. The incidence shows an increasing trend with age. The male incidence is more than female rates. The respective rates are 24.42 and 13.95 per cent per 1000 population. At age 35-44 years, 46.77 per cent of population smoke cigarettes and other things. In accordance with age and sex specific, there is a variation in smoking pattern. But the prevalence of tobacco is very prominent in their social life. Practically, there is taboo in taking and offering tobacco among juniours. The intensity of tuberculosis and respiratory infections are major causes of abnormal death in Sikkim. It accounts the smoking habit both among male & female.

Table - 30 Prevalence of Tobacco Chewing<sup>33</sup>

Age groups	Total male	No.of tobacco taker	Total females	No.of Tobacco taker	Total surveyed	Tobacco takers
14 and below	680	12	670	5	1350	17 (1.26)
15-24	431	132	379	38	810	170 (20.98)
25-34	316	167	248	73	564	240 (42.55)
35-44	212	132	160	47	372	179 (48.12)
45-54	130	56	103	26	233	82 (35.19)
55 and above	113	45	86	18	199	63 (31.65)
Total	1882	544 (28.90)	1646	207 (12.57)	3528	751 (21.28)

*Source : Cimpiled from Personal Survey.*

Tobacco chewing is also common habit in Sikkim. Tobacco chewing causes different kind of oral cancer and excessive taking causes respiratory problem also. It is almost twice a common among adult men as women.

It also causes a decade of gum and prelates teeth infections. The survey results indicates that 21.28 per 1000 population are addicted to tobacco chewing.

The prevalence of the habit is highest in the 35-44 age group. At age 15-24 years, 20.98 per cent population take tobacco. In the age group 25-34 years, the percentage is 42.55 and it is 48.12 per 1000 population in the 35-44 years age group. The subsequent percentages are 35.19 and 31.65 respectively. Sex specific division reveals that the percentage of male chewers i.e. 28.90 is more than double than the female chewers per cent is 12.57. Tobacco chewing also raises the morbidity of the Sikkimese people and lowers down the probability of survival.

Table - 31 Districtwise Prevalence of Smokers by age-sex (per cent) <sup>34</sup>

Age group	East		West		South		North	
	Male	Female	Male	Female	Male	Female	Male	Female
Below 15 years	0.2	0.07	0.07	0.12	3.4	0.07	0.2	0.3
15-24	3.9	1.8	3.7	1.8	7.2	5.3	3.8	1.8
25-34	17.7	9.5	18.5	8.7	47.2	31.7	18.1	8.2
35-44	22.9	21.5	37.2	23.1	63.8	53.2	32.7	20.6
45-54	32.7	33.6	30.2	32.7	57.8	37.2	28.4	27.2
55+	48.1	35.8	47.4	34.0	59.1	43.2	42.6	29.3
Total	15.7	10.1	15.8	9.7	30.2	19.6	13.8	8.8

Source : Enumerated from Personal Survey data.

## References

1. Health Department; Govt. of Sikkim, Gangtok.
2. Ibid
3. Ibid
4. Ibid
5. Ibid
6. Sikkim : A statistical profile (1979-92) B.E.S. Planning and Development Deptt.  
Govt. of Sikkim
7. Ibid
8. Ibid
9. Conference of Central Council on Health and Family Welfare, New Delhi.  
Govt. of Sikkim, Gangtok
10. Ibid
11. Shiv Kumar, A.K-UNDP's Human Development Index. A compilation for  
Indian states
12. Annual Report - 1991-92 Ministry of Rural Development Economic and  
Political Weekly Vol XXX No 15 April 15,1995
13. Ibid, P.839-844
14. Sikkim at a glance - 1993. B.E.S. Gangtok
15. Annual Report - 1991-92 op.cit. P.839-844
16. Ibid
17. Ibid
18. Ibid
19. Ibid

20. Ibid
21. Conference of Central Council on Health and Family Welfare Govt. of Sikkim,  
Gangtok. P.21
22. Ibid P.21
23. Ibid
24. Ibid
25. Ibid
26. Ibid
27. Ibid
28. Personal Survey
29. Personal Survey
30. Personal Survey
31. Personal Survey
32. Personal Survey
33. Personal Survey
34. Enumerated from Personal Survey.

## **(B) Sikkim : An analysis of Mortality, Immunisation and Nutritional pattern**

**Mortality rate of Sikkim :** Births and deaths registration system of the under developed states are very poor. There is scarcity of reliable data on the age sex specific mortality rate. The registration of births and deaths Act 1969 was implemented to the state of Sikkim w.e.f. 1979. "Annual Report on the Registration of Birth and Deaths" is the first publication of Vital events in Sikkim. This publication is for the year 1991. The information on events of death is not satisfactory. There is no single infant death record during 1991.

In the rural areas, there are only 12 deaths. All the deaths are recorded from West district. But in urban area, out of 105 deaths, 69 per cent is males and 31 per cent is females. In Sikkim, 50 per cent of the total deaths were occurred institutionally. The maximum number of deaths were recorded in the age group of 25-34 years followed by 35-44 years during 1991. The male registration of vital events is more than female. The respective rates are 77 per cent and 33 per cent.(1)

Mortality pattern can be measured in a number of ways. Two methods are very popular. The calculation of crude death rates and age old sex specific death rates are regarded as first one. On the other hand, life table concept form the basis of measurement life table death is purely a function of age specific death rates and is independent of the age-sex composition of the population. So it is more appropriate to measure mortality more suitably.

Age pyramid of life table shows the mortality pattern and the proportion of young age structure and old age survivals. Sikkim is compared with

Table - I

<i>Age (years)</i>	<i>India 1971</i>		<i>India 1981</i>		
	<i>Male</i>	<i>Female</i>	<i>Male</i>	<i>Female</i>	
0-14	41.88	42.2	39.47	39.63	2(a)
60 and above	5.92	5.98	6.46	6.63	
<i>Sikkim</i>					
0-14	33.73	43.23	36.54	43.07	2(b)
60 and above	3.55	3.09	4.64	4.17	
<i>Kerala</i>					
	41.05	39.5	35.93	34.05	2(c)
	5.97	6.47	7.23	7.85	
<i>Sikkim 1992-93 Total</i>					
0-14	36.13	40.68	38.28		2(d)
60 and above	3.71	4.38	3.57		

India and Kerala. It depicts that the percentage of population in 60 and above age group is always below than the Kerala and even national average. The young age structure is very high in Sikkim and the proportion of female, at the 0-14 years age group always dominates the male proportion. But the spread of age distribution; i.e. survival at age 60 years and above, is very low. In Kerala, the proportion of populations 60 and above years age groups are 5.97 for male and 6.47 for female, but in Sikkim, the rates are 3.55 and 3.09. It is also below the national average. During 1981 & 1992-93, the respective rates of Sikkim are 4.64 and 4.38 for male and 4.17 and 3.57 for females respectively. During last

decade, huge development was made in the health sector of state. It implies that the increase in health infrastructure fails to raise old age survival and the prevalence of mortality is very high. It affects the expectation of life at birth. In developed countries the proportion of 65 years and above are 11 per cent, 13 per cent, 9 per cent and 16 per cent respectively for Canada, USA, Japan and U.K. in comparison to that the proportion of Sikkim is very low. Only Kerala achieves 7.23 and 7.85 per cent above 60 category in 1981. Whereas the proportion of sikkim has declined in 1992-93. The results of 1992-93 is based on survey. It indicated that a high mortality is observed among below 60 years age group. Age is regared as the main demographic factor affecting the mortality rate. There is a natural and biological pattern of mortality behaviour with age. There is also a biological variation of crude death rate with the age structure. The incidence of morbidity is very high at low ages and the intensity of mortality decline biological limit, the mortality rate sharply rises. The mortality or crude death rate pattern is influenced by the age structure of the population. The major causes which influence mortality rate largely are education, occupation pattern, nutritional level, housing conditions, prevalence of diseases, sanitation, public health services, medical services, ecological condition, food habit and after all general living standards of the people.

In sikkim, the mortality rate as given by the vital registration, Govt. of India is given here. These rates are calculated on the basis of three yearly moving average.

It is observed that the crude death rate of Sikkim is 9.8 per 1000 population during 1981-83 and the rural CDR is more than urban counterpart. The all India figure shows that the mortality rate of India is 12.1 per 1000 population during the same period which is more than sikkim. Sikkim marched with India in 1975 and it was landlocked backward buffer state. The literacy rate was only 34.05 per cent during 1981 and medical infrastructure was very poor.

Table 2

## Mortality rates for Sikkim &amp; India (Three Yearly moving average)

## Sikkim

Year	81-83	82-84	83-85	84-86	85-87	86-88	87-88	88-90
Total	9.8	10.2	10.6	10.9	10.9	10.7	9.8	8.9
Rural	10.6	11.1	11.6	11.0	12.0	11.8	10.9	9.6
Urban	6.1	6.0	5.4	5.8	5.9	5.7	5.0	5.0

## India

Total	12.1	12.1	12.1	11.8	11.3	11.0	10.7	10.3
Rural	13.3	13.3	13.3	13.0	12.4	12.0	11.7	11.2
Urban	7.7	8.0	8.1	8.0	7.6	7.6	7.4	7.2

*Source : Sikkim A Statistical Profile 1979-92, Govt. of Sikkim.*

The prevalence of diseases were very high. The economic condition of the people were worse in comparison to India. Yet the mortality rates were recorded much lower than the national average. But the age distribution shows that less 4 per cent of the total population survives at 60 and above ages. This proportion is always less than other states of India. As a consequence it may be concluded that the mortality rate must have a downward basis. Not only this, the infant mortality rate was also high in Sikkim during the last decade. Another important point is to be noted that but registration of state is very poor.

The census report also records that during 1988-90, overall mortality rate of sikkim is 8.8 per Cent of which 9.6 per cent rural and 5.5 per cent urban. The proportion of urban population is below 10 per cent in Sikkim. Indian crude death rate is 10.3 in 1988-89. The rate of Sikkim is less than India. The figures depict

that there is a rising trend in the mortality pattern in Sikkim since 1986-88. Later on the rates starts to decline. The major causes of decline is the huge investment in social welfare and health sector. The resource base of the state is inelastic. The economy runs mostly by the grants-in-aid of the central government. Sikkim is a special type of state due to political and strategic reasons. So a large amount of money is spent to develop the state as soon as possible. There is a clear declining tendency in mortality rate of India and it touched at 10.3 at 1981-90 and the same trend is followed in the rural as well as urban areas. In Sikkim, the improvement of health condition is marked from the low mortality rate as recorded in the cases.

The centre for monitoring Indian Economy has estimated the mortality rate of Sikkim and India in their publication in 1996. It estimates a mortality rate of 10.7 per 1000 population in 1985. The rural rate is 10.7 per cent whereas the urban mortality rate is 6.2. And the mortality rate of India is 11.8 per 1000 population in 1985. There is a closer similarities between two rates. The mortality rate of Sikkim is also less than national average. But in 1986, the picture is completely different. Overall CDR of Sikkim is 11.7 per cent which is more than national estimates i.e. 11.1 per 1000 population. The rural death rate of Sikkim also suppress the national rural rate but the urban rate is lower than national average. In 1986, the mortality rate of Sikkim rises, but in national level it falls from 11.8 to 11.1 per cent. The rural growth rate of mortality is more than one per cent in Sikkim during the period. From 1987, the death rate of Sikkim declines and it stands at 7.3 per cent in 1990 and the lowest mortality rate is recorded in 1992. The rate is 6.9 per 1000 population. In the national level also reflects a constant declining trend during the period.

The overall decline of mortality rate is 35.51 per cent during 1985 to 1992 in Sikkim. The reduction percentage is 39.31 in rural Sikkim during the same period. The reduction in urban mortality rate is 67.74 per cent. It is more than all Sikkim and rural declination, although the proportion of urban population is very low; nearly 9% of the total population in Sikkim.

Table 3

Estimated mortality rates for Sikkim and India <sup>5a</sup>**Sikkim**

Year	1985	1986	1987	1988	1989	1990	1991	1992
Total	10.7	11.7	10.3	10.1	9.1	7.3	7.5	6.9
Rural	11.7	12.9	11.4	11.1	10.1	N.A.	8.5	7.1
Urban	6.2	6.1	5.4	5.5	4.3	N.A.	3.0	2.0

**India**

Total	11.8	11.1	10.9	11.0	10.3	9.7	9.8	9.3
Rural	13.0	12.2	12.0	12.0	11.1	10.5	10.6	10.6
Urban	7.8	7.6	7.4	7.7	7.2	6.8	7.1	5.8

*Source : CMIE, Basic Statistics Relating to Indian Economy.*

During the 1985-92, 21.18 per cent mortality declination is observed in the national level and the reduction rates of rural and urban areas are 18.46 and 25.64 per cent respectively. It is evident that urban achievement is always more than others.

If we compare the performance of state level and national level, then we can conclude the performance of the Sikkim state is an advantages position in every sphere of mortality rates. The achievement of the state is more significant. This is possible due huge investment in health sector during the last decade and spread of medical facilities and educational facilities all over Sikkim. During the gestation period, the rates were high. But the impacts are realised after the gestation period. It indicates that urban mortality rate declines more than rural areas. The major factors which are significant for this, are education, social consciousness, better sanitation, occupation structure and better social amenities. Traditional way

of life (cultivation and herding) limits the aspiration of the rural people. It breeds furstation among them. Beside other factors, it also reduces the expectation of life.

Table 4

Districtwise Mortality rate (survey based) <sup>6</sup>

<i>Districts</i>	<i>Total population</i>	<i>No. of Death</i>	<i>Mortality rate</i>
East	1317	10	7.59
West	1004	8	7.96
South	889	5	8.99
North	318	5	15.7

*Source : Personal Survey*

During the survey, number of deaths were recorded from four districts of Sikkim. The number of total household was 645, comprising 3528 total population. The sample size is small. So it may not represent the real picture. Yet the results are given here. The prevalence of death varies from year to year. Death rates for East, West, South and North districts are recorded as 7.59, 7.96, 8.99 and 15.7 per 1000 population respectively. The overall death rate is recorded as 8.78 per 1000 population. Death rate of Sikkim is much lower than the national average. In accordance with CMIE, the Indian death rate is 9.3 per 1000 population in 1992. Out of 3528, the incidence of death during the period is recorded at 31. Above table reveals that the incidence of death is highest in the North district, i.e. 15.7 per 1000 population and lowest in the East district . The literacy rate and the proportion of urban population are maximum in east district and minimum in the North district. Besides these, North district is more isolated than East. The mode communication and transmission e.g. Television etc. are limited in North and the

circulation newspaper and social interaction is also limited within the same group or ethnic composition. Specially, the valleys are isolated and traditional mode to medical treatment is more popular than modern medical facilities. Alcoholism is also very common. The prevalence of diseases e.g. respiratory infections, hill diarrhoea etc. are more acute among them. All these factors increase the death rates.

It is also observed that death rate among women in the age group 15-50 years is more than male counter part. The leading causes of death are premononia, pulmonary tuberculosis, gastrointestinal infections and acute respiratory infections. The major causes of death is excessive alcoholism, malnutrition and deficiency of proper diets (including vitamins) also.

There is no exact reliable mortality rate of Sikkim. The records are misleading. There is a wide variation of mortality rate records from different sources. The centre for monitoring Indian Economy estimates the mortality rate as 6.9 per 1000 population for 1992 in Sikkim and for 1991 it is 7.5 per cent. The household survey results estimates the death rate is 8.78 per 1000 population in 1992-93.

Table 5

Death rate from different sources <sup>7</sup>

	Mortality rate	Year
(i) CMIE	6.9	1992
(ii) CMIE	7.5	1991
(iii) Survey	8.78	1992-93
(iv) Sikkim Herald	17.3	1993
(v) Veena Bhasin	10.9	1989
(vi) Register General of India	8.8	1988-89
(vii) Life table death rate	10.38	1992-93

Sikkim Herald, a government newspaper, estimates the mortality rate 17.3 per 1000 population in 1993.

Probable Life table probable death rate for Sikkim (1981) = 20.68

Probable Life table death rate for Sikkim (1992-93) = 10.38

Beena Bhasin's estimation is 10.9 for 1989. The Registrar General of India provides an estimation of 8.8 per 1000 population. Besides these CMIE estimated the national rate at 9.8 for 1992 and 10.6 for rural area in 1992. Considering wide variation and realising the lack of proper registration the life table death rate is taken as 10.38 per 1000 population. People are scatteredly settled in Sikkim and the mode of communication is very poor. Most of the rural people suppress the incidence of death due to different social and legal factors. Specially, the infant deaths are kept secret i.e. the annual registration shows not a single infant death during 1991 which is absurd. The utility of registration is negligible to them. On the other hand, the prevalence of traditional treatment by local doctors and Jhankris causes a significant number of death. But this deaths are kept silent due to social

factors and the abnormal deaths are also misreported. Qualified doctors are very rare except urban area. Due to the above factors, the death rate are reported at a lower scale. But if we observe the percentage of population above 60 years, we can easily conclude that the mortality rate is more than the official estimation. Only three to four per cent of the total population survives above this age group and this proportion is always lowest in comparison to other states in India during 1971 to 1981. The female proportion is always below than male percentage. It implies that the prevalence of death among female is more than male. As a consequence the probable death rate is taken as 10.38 per 1000 population in Sikkim.

**Reference**

- 1) Annual Report on the Registration of Birth and Deaths. 1991 B.E.S. Gangtok.
- 2) a) Centre for monitoring Indian Economy  
b) Basic Statistics relating to Indian Economy P-116
- 3) Personal Survey
- 4) A Statistical Profile of Sikkim - 1971. B.E.S. Gangtok
- 5) a) CMIE, Basic statistics relating to Indian Economy. p-116
- 6) Personal Survey
- 7) CMIE, Survey, Sikkim Herald, RGI, Life table. Veena Bhasin.

Table - I

## Immunisation Pattern in Sikkim

T.T. for Expected Mother<sup>1</sup>

Year	Annual target	Achievement	% achievement of annual target
1990	13428	5624	42.1
1991	12270	5599	45.6
1992	11460	6955	60.7

*Source : Health & Family Welfare, Govt. of Sikkim.*

Immunisation measures reduce the incidence of death among pregnant women. The T.T for expected mothers are given here. During 1990, annual target of the state government was 13428 expected mothers but at the official level. The achievement was shown as 42.1 per cent. The achievement percentage has increased to 45.6 in 1991, but the interesting point is that annual target and achievement number was less the previous year. Although, the number of achievement is recorded a maximum figure i.e. 6955 and the percentage was 60.7 in 1992. But the household survey results are far below and the record of vaccination during pregnancy rarely occurs. Not only this, the mortality trends show that 15-49 years age group female mortality is higher than male death rates during the same 1990-93 but also the life expectancy of female is less than male. People are not aware of the modern pre-cautionary measures. They also fear to accept it. Beside social taboos, lack of mass involvement and motivation restricts the immunisation pattern among pregnant women in Sikkim.

Table - 2

D.P.T.Vaccination<sup>2</sup>

<i>Year</i>	<i>Annual target</i>	<i>Achievement</i>	<i>% achievement of annual target</i>
1990-91	12169	10371	85.2
1991-92	11120	9642	86.7
1992-93	10410	9726	93.5

*Source : Health and Family Welfare, Govt. of Sikkim*

Vaccination is important in protecting the prevalence of infant mortality. The infant mortality rate was very high in 1971-81 but due to rapid expansion different government sponsored vaccination and health care measures has able to reduce the impact. During 1990-91, total annual target was 12169 of which 85.2 per cent of the target is achieved. Total target was 10410 D.P.T vaccination in 1992-93. It achieved 9726 children vaccination. It obtained highest percentage i.e. 93.5. The annual target rate had declined but the number of achievement increased marginally than previous year. So this is technical achievement but not social as it was seen in the record.

Table - 3

Polio Vaccination<sup>3</sup>

<i>Year</i>	<i>Annual target</i>	<i>Achievement</i>	<i>% achievement of annual target</i>
1990-91	12169	8869	72.9
1991-92	11120	9662	86.9
1992-93	10401	9737	93.6

*Source : Health and Family Welfare, Govt. of Sikkim*

Polio is mostly concentrated among children. It disables the children. Government has taken a massive programme of pulse polio all over the country during this year. Annual target was 12169 in 1990-91, out of them 8869 were vaccinated. The achievement proportion is 72.9 per cent. From the above figures it is clear that annual achievement target has increased to 86.9 per cent in 1991-92 and it rose to 93.6 per cent in 1992-93. Although the achievement percentage is significant in Sikkim. But the annual target of the government is very low i.e. near 10 to 12 thousand child and the amount of the target declined year after year. The state level achievement is impressive. The survey results shows that only 55.01 per cent of the total children come under the purview of DPT and polio vaccination in Sikkim. So there is large gap in reaching the goal of polio vaccination as depicted in the government publications.

Table - 4

B.C.G. Vaccination <sup>4</sup>

<i>Year</i>	<i>Annual target</i>	<i>Achievement</i>	<i>% achievement of Annual target</i>
1990-91	12169	10779	88.6
1991-92	11120	10360	93.2
1992-93	10401	9978	95.0

*Source : Health and Family Welfare Department, Govt. of Sikkim*

The performance of BCG vaccination programme is satisfactory at the official level. Immunisation status of children was targeted at 12169 in 1990-91. B.C.G vaccination was received by 10779 children and the achievement percentage was 88.6. Immunisation proportion improved in 1991-92. The achievement percentage is 93.2 which was 4.5 per cent in 1992-93. UNICEF study (1989) shows that there is a difference in immunisation pattern in rural and urban areas of Sikkim.

Urban performance is always better than rural areas. The respective percentages are nearly 60 and 77 per 1000 live births.

Table - 5

Measles vaccination <sup>5</sup>

<i>Year</i>	<i>Annual target</i>	<i>Achievement</i>	<i>% achievement of Annual target</i>
1990-91	12169	7591	62.4
1991-92	11120	7942	71.4
1992-93	10401	8399	80.7

*Source : Health and Family Welfare dept. Govt. of Sikkim*

Sikkim is a cold prone state. The incidence of measles are very common in Sikkim. The performance of the health department is significant. But the coverage is limited. Yet the achievement rates are 62.4, 71.4 and 80.7 per cent of the annual target. So child deprivation of measles vaccination is reduced from nearly 38 per cent to 20 per cent during 1990-93. But an UNICEF sponsored study reveals that only thirty eight per cent of total infants had received measles vaccination. So there is obvious gap and deprivation is more as projected by the Government. Measles vaccination lowers-down the infant and child mortality. In Sikkim, measles vaccination has lowered down the infant mortality rate directly and indirectly.

Table - 6

D.T. Vaccination<sup>6</sup>

<i>Year</i>	<i>Annual target</i>	<i>Achievement</i>	<i>% achievement of Annual target</i>
1990-91	9011	7603	84.4
1991-92	8234	5828	70.8
1992-93	8460	6172	72.9

*Source : Health and Family Welfare Department, Govt. of Sikkim*

Out of 9011 population, the achievement is 7603. The achievement rate was 84.4 per cent. But it is evident from the above figure that annual target was reduced to 8234 and the number of achievement also declined to 5828. It proposed 70.8 per cent achievement and D.T. VACCINATION DEPRIVATION rate stands at nearly 33 of the total target. Although the vaccination of D.T. is very essential in Sikkim, but the annual target declined from 9011 to 8460 during 1990-91 to 192-93. It covers only a little fraction of the total population. Irrespective of achievement percentage, the total target should be enlarged to raise the capability of the people.

Table - 7

T.T for 10 years<sup>7</sup>

<i>Year</i>	<i>Annual target</i>	<i>Achievement</i>	<i>% Achievement of Annual target</i>
1990-91	8260	5947	72.0
1991-92	7548	4787	63.4
1992-93	7740	6571	84.9

*Source : Health and Family Welfare Department*

Above figures revealed a small target, rounding eight to seven thousand only. Although the achievement per cents were 72.0, 63.4 and 84.9 respectively during 1990-91, 1991-92 and 1992-93. The annual target declined from 8260 to 7740 during the period. In comparison to total population Tetanus toxic for 10 years was very low. It needs more target to improve the quality of life and to prevalent the incidence of Tetanus among them.

Table -8

T.T. for 16 years<sup>8</sup>

<i>Year</i>	<i>Annual target</i>	<i>Achievement</i>	<i>% Achieved of annual target</i>
1990-91	8260	2555	30.9
1991-92	7584	1881	24.9
1992-93	7740	2430	31.4

*Source : Health and Family Welfare Department*

Tetanus toxic for 16 years boys and girls are very limited. Annual target was 8260, but the achievement was also very low i.e. 2555. It achieved 30.9 per cent of annual target in 1990-91. In the next year the achievement rate was 24.9 per cent which was below the performance of previous year. During 1992-93, annual target was 7740, of which 31.4 per cent was achieved. Overall picture showed that the performance of T.T for 16 years was not satisfactory in Sikkim.

Table - 9

Prophylaxis against Nutritional Anaemia among women<sup>9</sup>

<i>Year</i>	<i>Annual target</i>	<i>Achievement</i>	<i>% Achievement of Annual target</i>
1990-91	10700	17770	161.6
1991-92	16000	12727	79.5
1992-93	11460	19430	169.5

*Source : Health and Family Welfare Department, Govt. of Sikkim.*

Measures were taken to guard women against nutritional Anaemia. Pregnant and lacting women of Sikkim do not take balanced diet. The food provided to them is low for their nutritional status. They do not get the necessary amount of calories, proteins and vitamins in food. Traditional food habits and poverty are the main causes for their deficiency in nutritional requirements. It is evident that female mortality is more than men mortality in Sikkim. It causes several kinds of diseases among women and the prevalence of diseases also increases with nutritional anaemia.

The achievement of annual target was 161.6 per cent in 1990-91 which was more than target. The performance was very satisfactory in 1990-91. But there was a sharp fall of percentage during 1991-92. It stood at 79.5 per cent i.e. loss of

almost 80 per cent. This was due to increase in target and curtailment of government expenditure during 1991-92. Yet during 1992-93, the achievement per cent was 169.5 which was maximum during the whole period. This was possible due to sharp reduction in target and increase in performance.

Table - 10

Prophylaxis against Nutritional Anaemia among children<sup>10</sup>

<i>Year</i>	<i>Annual target</i>	<i>Achievement</i>	<i>% Achievement of Annual target</i>
1990-91	17700	14921	84.3
1991-92	21000	10572	50.3
1992-93	10400	6277	66.3

*Source : Health and Family Welfare Department, Govt. of Sikkim.*

Most of the mothers in Sikkim usually select and consume special foods during child birth and pregnancy. Their food items are mostly home made from locally available materials. Besides, these, they believe in various superstitions and social taboos regarding food consumption. Pregnant women generally do not take nutritious food and fatty items in the fear that this will abnormally increase the size of baby to be born. These beliefs are prominent among illiterate and ignorant women. Lower rate of female literacy in comparison to male hinders the scientific basis of these. Due to these social beliefs, high infant mortality still birth, malnutrition of children at their early ages occurs. The state government initiated some measures to guard against nutritional anaemia among children.

It is evident from the table that annual target was 17700 children in 1990-91. It achieved 84.3 per cent of the annual target during the period. The target was revised in the next year. It increased to 21000 children and achieved 50.3 per cent

of total annual target in 1991-92. It is seen that the achievement declined in terms of number and percentage too. Annual target was reduced to half than previous year in 1992-93. It achieved 66.3 per cent of the annual target which is more than previous year. But interesting point is that the number of achievement declined

sharply from previous 10572 to 6277 children in 1992-93, although the percentage performance was better than 1991-92.

### **Nutritional deficiency**

Nutrition anaemia among children is due to biological factors and socio-economic condition also. The prevalence of different kinds of diseases also affect the situation. Female education, nutritional diet and spread of scientific knowledge only can uplift in this field.

Table - 11

#### **Prophylaxis against Blindness due to Vitamin 'A' deficiency among children"**

<i>Year</i>	<i>Annual target</i>	<i>Achievement</i>	<i>% Achievement of Annual target</i>
1990-91	15500	13228	85.3
1991-92	21000	11195	53.3
1992-93	10400	11290	108.5

*Source : Health and Family Welfare Department*

Deficiency of Vitamin A causes night blindness and other diseases. The major source of Vitamin A is milk, eggs, green leafy vegetables, carrot and fruits. The food provided to children is poor for their nutrition requirement. They do not get required amount of vitamins in food. Traditional food habits and scarcity of

varieties food items are the main causes for their nutritional requirements. Market structure and urban centres are limited. Transportation is a major problem. Most of the vegetables are kept for a long time and the food value also declines with time. Guarding against blindness due to Vitamin 'A' deficiency among children is very essential in Sikkim.

The annual target was 15500 in 1990-91 but 85.3% of the target was achieved during the period. The official estimation also revealed that there was a wide gulf between target and achievement in 1991-92. Vitamin 'A' deficiency deprivation rose to nearly 47 per cent. So the government measures in guarding the deficiency was very poor. But the annual target declined to 10400 children in 1992-93, the achievement rate rose to 108.5 per cent. Annual target reduction is also children deprivation.

Table - 12

Immunisation status of children surveyed vaccination <sup>12</sup>

<i>Age group</i>	<i>Three doses of DPT</i>	<i>Measles</i>	<i>BCG</i>	<i>Partially</i>	<i>Not immunised</i>	<i>immunised</i>
0-1	n=154	75 (48.9)	65 (42.35)	70 (45.25)	16 (10.2)	67 (44.56)
2-4	n=247	145 (60.23)	102 (42.13)	137 (56.67)	17 (7.02)	72 (29.97)
5-9	n=502	274 (54.56)	138 (27.54)	214 (42.56)	29 (5.77)	205 (40.8)
Total	n=898	494 (55.01)	305 (33.96)	421 (46.88)	62 (6.9)	344 (38.03)

*Source : Personal Survey (Enumerated)*

Immunisation status of children was recorded during the survey. The data shows that all three primary doses of DPT and polio vaccination was received by 48.9 per cent of infants. Out of 154 infants, 75 infants are completely immunized. It also depicts that 65 out of 154 infants was vaccinated by measles. It achieved 42.35 per cent measles immunization among infants. The prevalence of measles among children is very high in Sikkim. BCG vaccination was received by 45.25 per cent of infants. It is also observed that partially immunization was received by only 16.2 per cent of infants. Out of 154 infants, 67 infants were not immunized at all. It implies that 44.56 per cent infants were not received any kind of immunization.

Three doses of DPT and polio vaccination was received by 60.23 per cent of infants of those between 2-4 years of age group. It also recorded 54.56 per cent immunization among 5-9 age groups. The age group is extended up to 9 years to overview and evaluate the overall performance of past.

Measles vaccine was received by 42.13 per cent of those between 2 to 4 years of age and only 27.54 of those between 5 and 9 years. It indicates that recent performance is better than previous years.

Fifty six per cent of those between 2 and 4 years were vaccinated with BCG and 42.56 per cent of those between 5 and 9 were vaccinated too. Overall 46.88 per cent was vaccinated with BCG.

Upto 9 years 6.9 per cent of the total children including was partially immunized and 38.03 per cent of children upto 9 years remained unimmunized. The overall, three doses of DPT and polio vaccination were received by 55.01 per cent of children upto 9 years. Measles vaccination was received by 33.96 per cent of children upto 9 years age.

An UNICEF sponsored (1990) study shows districtwise immunization status of under fives. East had the best coverage and West district had poor immunization status with 46% unimmunized and 9% partially immunized. Coverage with measles vaccination was very low in South and West districts. DPT and polio vaccine coverage was 58.6 for South, 43.5% for West and 54% for North districts. The

best coverage was found in East where 69% of infants. 70% of those 2-3 years & 59% of those between 3-5 years were found fully immunized with all the primary doses.

Integrated child development scheme has been launched in all the districts of Sikkim for last few years. The national status of women was survey by UNICEF and Government of Sikkim in 1990. It states, "... the nutritional assessment was very essential, it was decided that all children attending ICDS projects in sampled revenue blocks and their mothers should be examined and their sex, age, height and weight should be recorded. This method gave a reliable information for working out nutritional indices for mothers and children for the year 1990".

Table - 13

Nutritional Status of Mothers of under fives (BMI) in Sikkim<sup>13</sup>

<i>Age</i>	<i>Under nourished</i>	<i>Average nutrition</i>	<i>over nutri- tion</i>	<i>Stunted 150 (m) %</i>	<i>Total %</i>
15-24	115 (28.39)	222 (54.81)	22 (5.43)	46	405
25-29	142 (31.14)	240 (52.63)	27 (5.92)	47	456
30-34	90 (30.92)	148 (50.85)	21 (7.21)	32	291
35-44	98 (29.08)	168 (49.85)	26 (7.71)	45	337
45 and above	15 (25.42)	32 (54.23)	15 (25.42)	7	59
Total	460 (29.7)	810 (52.3)	101 (6.5)	177 (11.4)	1548 (100)

Source : *Health Status of Women and Children in Sikkim UNICEF & Govt. of sikkim.*

Their physical weight and height were recorded with age to compute nutritional index. Even all the children in ICDS project were weighed and their nutritional status was assessed, as the formulation of Indian Academy of paediatrics. From all these informations Body Mass Index was prepared for each mother and children.

The above table showing the nutritional status of women in Sikkim was compiled from the publication of UNICEF in 1993. Total number of women was 1548. Nutritional status was .PA

classified as under nourished, average nutrition, over nourished & stunted. The total female population excluding below 15 years were classified into broad four age categories. It showed that out of 1548 women surveyed 460 were found to be under nourished. Mal nutrition incidence was recorded for 26.7 per cent of the total women. Maximum per cent of malnourished women i.e. 31.14 were found in the 25-29 years age group. And the trend of malnourished per cent remained in and around thirty upto 35-44 years of age group. 25.42 per cent malnourishment was recorded in the 45 and above age group. Poverty and traditional food habits were two major causes of malnutrition.

52.3 per cent women were received average nutritional status out of 1548 women. Average nutrition was recorded more than fifty per cent. Of them 54.81 per cent of the women were received average nutrition in the 15.24 years age group. It was recorded as maximum and 52.63% of those between 25 to 29 years and 50.85% of those women between 30 to 34 years and 49.85% of those between 35 to 44 years and 54.23% of those 45 years and above.

101 (6.5%) women were found to be over nourished 15 (25.42 per cent) women were estimated to be over nourished in the age group 45 and above. It recorded the maximum per cent of women.

One hundred and seventy seven (11.4 per cent) women were recorded with heights less than 140 cms and these women were termed as stunted. The undernourishment was to the extent of 27% in East, 28.4% in South, 30% in North and 33% in West districts. Women nutritional pattern have a greater impact on the

female death rates and infant mortality also. So a careful evaluation is to be made to uplift the status of women in raising their capability.

Table -14

Age specific Nutritional Status of boys below 5 years of age<sup>14</sup>

Age group	Degree of malnutrition					Total
	I	II	III	Normal	Ab-Fat	
0-6 months	11 (14.1)	7 (8.9)	5 (6.4)	39 (50.0)	16 (20.5)	78
6-12 months	16 (13.6)	20 (17.1)	10 (8.5)	46 (39.3)	25	117
1-2 Yrs.	35 (17.0)	26 (12.6)	15 (7.3)	106 (51.4)	24	206
2-3 Yrs.	39 (18.5)	17 (8.0)	13 (6.1)	117 (55.4)	25	211
3-5 Yrs.	157 (25.5)	93 (17.5)	17 (3.2)	219 (41.2)	46	532
Total	258 (22.6)	163 (14.2)	60 (5.2)	527 (46.0)	136 (11.9)	1144 (100)

Source : Health status of women and children in Sikkim by UNICEF & Govt. of Sikkim.

There were six age group. The classification of nutritional status of boys below 5 years of age was made on the basis of degree of malnutrition, normal and abnormal fatty. Out of 1144 boys 22.6 per cent were under 1st degree malnutrition, 163 boys (14.2 per cent) were under 2nd degree malnutrition and 60 boys (5.2 per

cent) were under third degree malnutrition. It is also observed that first degree malnutrition increased as age advanced in boys. Maximum number of 1st degree nourished boys (29.5 per cent) were concentrated in the 3-5 years age group and lowest percentage (14.1) was concentrated in the 0-6 age groups. Second degree malnutrition showed a heterogenous trend. It varied from to 17 indifferent age groups. Most of 2nd degree malnourished were recorded in the 3-5 years age group. Third degree malnourishment was estimated 5.2 per cent of the total boys. It varied from 3.2 per cent to 8.5 per cent in different age composition. Maximum per cent of 3rd degree malnourishment was observed in the 6-12 months age group.

527 (46 per cent) boys out of 1144 were found to be normal category. Of them 39 (50%) boys of 0-6 months age group were also found to be normal and the highest percentage of normal boys were recorded in 2-3 years age group and lowest percentage was observed in the 6-12 months age group. Beside this, 136 boys (11.9%) were found to be abnormally. It was also noted that 70 per cent of the boys weighed normal or above normal when they were below 5 months of age.

Age and nutritional classification were same among girls as compared to boys out of 1100 girls 28.4 per cent were under first degree malnutrition. It was also observed that first degree malnutrition increased as age advanced in girls. It followed the same trend among both boys and girls. It was also noticed that maximum number of 1st degree malnourished girls were concentrated in 3-5 years age group. The percentage was 34.9. In comparison to boys, first degree malnutrition was more among girls. The lowest 1st degree malnutrition was observed in the 0-6 months age group.

173 girls (15.7 per cent) were under second degree malnutrition. Second degree malnutrition was recorded maximum percentage, i.e. (25.9%) in the 0-6 months age group and in comparison to boys, second degree malnutrition among girl infant was 3 times more. It revealed the neglect of girl child and gender bias in child care.

Table - 15

Age specific Nutritional Status of Girls below 5 years of age<sup>15</sup>

Age group	Degree of malnutrition			Normal	Abnor- mal Fat	Total
	I	II	III			
0-6 months	15 (19.5)	20 (25.9)	4 (5.2)	25 (32.5)	13 (16.9)	77
6-12 months	27 (22.5)	22 (18.3)	16 (13.3)	37 (30.8)	18	120
1-2 Yrs.	37 (21.9)	24 (14.2)	15 (8.9)	81 (47.9)	12	169
2-3 Yrs.	46 (23.5)	19 (9.7)	7 (3.6)	104 (53.0)	20	196
3-5 Yrs.	188 (34.9)	88 (16.3)	31 (5.7)	212 (39.4)	19	538
Total	313 (28.4)	173 (15.7)	73 (6.6)	459 (41.7)	82 (7.4)	1100 (100.00)

Source : UNICEF & Govt of Sikkim.

73 girls (6.6%) were under 3rd degree mal-nourishment, of those belonged to 6-12 months girls suffered most. Among 2-3 year of age group, the 3rd degree malnutrition was very low, i.e. 3.6 per cent.

459 girls (out of 1100) were found to be normal. 41.7% of the girls were observed to normal which was lower than boys normalcy rate. It also indicated a gender bias in social system. Maximum percentage of normal nutrition was found in the 2-3 years of age group. Boys and girls showed the same pattern with respect to normal nutrition in the 2-3 years of age group.

82 girls (7.4%) were found to be abnormal fat and this abnormality was highly concentrated in the 0-6 months age group. It was also to be mentioned that abnormal fat percentage was more among boys than girl child. Lastly, 50 per cent of the girls weighed normal or above normal when they were below 6 months of age. It implied that socio-economic factors were more responsible in increasing the malnutrition status among girls and boys aged below 5 years: because the biological factors influenced the infants during and before live births.

### Age Specific and Infant Mortality Rate in Sikkim.

Infant mortality is composed of two components. These are neonatal and post neonatal mortality. Neonatal mortality refers to death under four weeks and post-neonatal mortality refers to death between four week to one year. Hence the sample, is very small, so separation is not done. Yet the common causes of neonatal deaths are low birth weight, pneumonia, gastrointestinal infections, fever, tectal asphyxia and etc.

Table - 16

#### Age Specific Mortality Rate<sup>16</sup>

<i>Age group</i>	<i>Total Population</i>	<i>No. of death</i>	<i>Mortality Rate</i>
0-1	154	16	38.96
2-14	1196	5	4.18
15-49	1666	14	8.40
50+	306	6	19.60
Total	3528	31	8.28

7

Post-neonatal causes of deaths are pneumonia, acute diarrhoeal diseases, malnutrition, fever and anaemia. These two death rates combinedly shows the

infant mortality rate. From the survey data an overall infant mortality of 38.96/1000 live births is recorded.

At the 2-14 age groups, the number of death is only 5 and the rate is 4.18 per 1000 live births. The major causes of deaths are pneumonia, T.B, Measles, Meningitis, Fever and Gastrointestinal infection etc. The prevalence of death is more acute in the 50 and above age group. But the 15-49 age group is more vital, the female death rate is more than male due to pregnancy. A study by UNICEF shows that the women mortality rate is twice as compared to male mortality. Besides pregnancy prevalence, tuberculosis, fever with chronic cough, acute gastrointestinal infections, and malnutrition are dominant.

The record of infant mortality is practically absent in the registration. There is no proper registration system in Sikkim. Different estimates show different figures.

Table - 17

Infant mortality from different sources<sup>17</sup>

Source	Infant mortality	Year
(i) Sikkim Herald	49	1993
(ii) Sunshine in Sikkim Ananda Bazar Patrika	45	1996
(iii) Veena Bhasin	117	1989
(iv) Survey	38.96	1992-92
(v) Probable infant mortality rate	63.00	1992-93
India	79	1992.

Probable infant mortality rate for Sikkim (1992-93) = 63

Probable infant mortality rate for Sikkim (1981) = 100

The estimation of Sikkim Herald shows the infant mortality as 49 per 1000 new born infant in 1993. The govt. of Sikkim shown as 45 per 1000 babies in Ananda Bazar Patrika 12 Dec. 1996.

Veena Bhasin shows the rate as 117 per 1000 infant in 1989. The national average is 79 in 1992. Considering all these the probable infant mortality rate is taken as 63 per 1000 infants in 1992-93.

Biological and socio-economic factors are responsible for this. Infant mortality rate highly depends on the nature of immunisation measures. People are not aware of the immunisation system which is taken by the government. Besides this, the socio-economic condition of the people also affects mortality. It is evident that the high mortality is associated with poverty, ignorance, malnutrition, improper housing pattern, lack of personal and environmental hygiene and low level of immunity. In Sikkim most of factors are prominent, as a result the infant mortality is also high. The official estimation is underestimates the real situation. Most of the infant mortality are suppressed by the people.

The infant mortality rates are a significant demographic and biological variable. It influences the fertility behaviour socially and psychologically. The fertility rate is very high in Sikkim Infant mortality is regarded to be a most sensitive index of health conditions of a country. The endogenous causes e.g. congenital abnormalities is difficult to control; but the endogenous factors like nutrition, prenatal care, sanitary conditions, incidence of diseases to which infants are highly prone, can be controlled by the government and NGO's. Besides genetic and endogeneous factors, biological factors like the age of mother, order of birth, prematurity and birth gap also have a vital impact on the survival of the infant. Infant mortality shows a J-shaped curve with the age of mother; the lowest rate is at ages 24-29 but it increased sharply with age increase and less sharply with age decrease (Srivastave & Saxena 1981). There is also universal correlation of infant mortality with low birth weight.

The main causes of infant and child mortality are infections parasite, nutritional, respiratory and other perinatal diseases. But in Sikkim and over all

India the infant mortality rate has declined sharply. This decline has been an outcome of many developmental and health measures taken by the government for example immunisation of children from infectious, parasitic and respiratory diseases, general improvement in sanitary conditions, access to safe water eradication of many diseases like small pox etc. Besides this, development measures like availability of medical facilities, motorable roads, electricity, education and improvement in living conditions have resulted in a decline in infant mortality (Reg. General of India 1979).

There are social and economic factors which intensify the problem of infant mortality. It is wellknown that education reduces fertility directly and indirectly it reduces mortality too. Maternal education also influences the infant mortality and general mortality also.

At the international level, the level of infant mortality rate and fertility show a lower level in comparison to underdeveloped countries. The IMRs of USA and Canada are 9.0 and 7.1 and the fertility rates are 1.8 and 2.0 respectively in 1992. In India, the picture is different. These rates vary from state to state. Kerala is leading with lowest infant mortality rate i.e. 17 per 1000 live births and fertility rate at 2.0 per cent per woman. On the other hand Orissa records the highest infant mortality rate i.e. 126 per 1000 live births and U.P. records maximum fertility rate in 1991. The infant mortality of Sikkim, 63 per 1000 live birth is better than national average of 79 per 1000.(18)

The literacy rate of Kerala is highest among the states; it reduces IMR and fertility rate directly. Occupation pattern is also significant in reducing both the vital events.

The variation in mortality condition among regions exists everywhere. The regional variation occurs due to the availability of preventive and treatment facilities. Climatic factors may also play an significant role. The climatic condition of Sikkim is very worse. The prevalence of diseases are generally more in Sikkim.

Hinduism and Buddhism are two important religious in Sikkim. Religious differences in demographic behaviour is an established fact. Besides economic

activity, there are some social norms and spiritual values which varies from religion to religion. This differential also influences. Their life style and thereby differences in mortality level.

The area of dwellings has an inverse relationship with mortality level in general. Economic classification of social strata also influences the mortality pattern. Rural-urban differential in mortality is also prominent in India and even in Sikkim also. Rural rate is always more than urban mortality rate. Sanitary condition also affects mortality level. However, infant mortality is proportional to total mortality. The decline in mortality can be judged to better health and nutrition for infants, improved delivery practices, the use of hospitals for child birth, use on nurse, control of epidemics etc. The infant mortality is very sensitive. The life table construction is largely influenced by the mortality rate, especially infant mortality rate. Higher IMR reduces the expectation of life. So a proper care should be taken to lower down the overall mortality rate including infant mortality rate.

**References**

- 1) Conference of Central Council in Health and Family Welfare Govt. of Sikkim, Gangtok P.7
- 2) Ibid
- 3) Do
- 4) Do
- 5) Do
- 6) Do
- 7) Do
- 8) Do
- 9) Do
- 10) Do
- 11) Do
- 12) Personal Survey
- 13) Health status of Women and Children in Sikkim. Survey sponsored by UNICEF & Govt. of Sikkim.
- 14) Ibid. P.45
- 15) Ibid. P.45
- 16) Personal Survey
- 17) Sikkim Herald, AB Patrika, Survey, Veena Bhasin
- 18) CMIE, PPS, World, USA