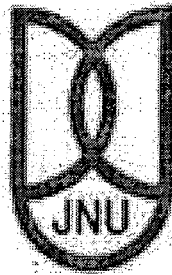


**Factors Influencing Ailing and Hospitalization in India:
An Analysis of NSSO 52nd (1995-96) and 60th Round (2004)**

*Dissertation submitted to School of Social Sciences, Jawaharlal Nehru University
in partial fulfillment of the requirement of the award of the degree of*

MASTER OF PHILOSOPHY

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DECLARATION

I, Sarda Prasad, declare that the dissertation entitled “**Factors Influencing Ailing and Hospitalization in India: An analysis of NSSO 52nd (1995-96) and 60th round (2004)**” submitted by me for the award of the degree of Master of Philosophy of Jawaharlal Nehru University is my bonafide work. The dissertation has not been submitted for any other degree of this university or any other university.

.....
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CERTIFICATE

We recommended that this dissertation be placed before the examiners for evaluation.

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Supervisor

July 16, 08

.....16.7.08
(Prof. R.K SHARMA)

Chairperson

**Dedicated
To
Supervisor**

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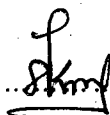
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ACRONYMS:

AIDS	Acquired Immune Deficiency Syndrome
ALRI	Acute Lower Respiratory Infection
ANM	Auxiliary Nurse Midwives
ARI	Acute Respiratory Infections
ASHA	Accredited Social Health Activists
AYUSH	Ayurved, Unani, Yoga, Sidha and Homeopathy
CHC	Community Health Centre
COPD	Chronic Obstructive Pulmonary Disease
HIV	Human Immune Virus
HPV	Human Papilloma Virus
ICD- 10	International Classification of the Diseases- 10 th version
ICMR	Indian Council of Medical Research
ICRIER	Indian Council for Research on International Economic Relations
ILO	International Labour Organization
LPG	Liquefied Petroleum Gas
MDGs	Millennium Development Goals
MDR-TB	Multidrug Resistant Tuberculosis
MDT	Multi Drug Therapy
MPW(M/F)	Multipurpose Worker (Male/Female)
NRHM	National Rural Health Mission
NSSO(s)	National Sample Survey Organization/ Offices
OBCs	Other Backward Castes
PHC	Primary Health Centre
PRIs/ CBOs	Panchayati Raj Institutions/ Community Based Organizations
RTI	Reproductive Tract Infection
SCs/ STs	Schedule Castes/ Schedule Tribes
STD	Sexual Transmitted Disease
STI	Sexual Transmitted Infection
T.B.	Tuberculosis
WHO	World Health Organization

Chapter 1

Introduction

Chapter 1

Factors Influencing Ailing and Hospitalization in India: An Analysis of NSSO 52nd (1995-96) and 60th Round (2004)

1.1. Introduction

A healthy citizen is an asset to the community. Healthy community is the foundation of strong nation, and it is an important determinant of economic and social development energy. A patient is a burden on society and his maintenance costs could be higher than curing. Cost of curing is higher than the cost of preventing disease. Preventing disease is better than curing it, from individual as well as social point of view (Durgaprasad and Madhuri, 2004). A state of well being contributes to raise national productivity and improves many social indicators of better living. Health of an individual is defined as a state of complete physical, mental and social well being that enables an individual to be productive, free from disease and thus able to access the opportunities available in the environment (WHO, 1946). “Hospitalization is a two-edged sword. When, patients with border line personality disorder were admitted. They enter an environment that reinforces the very behaviours that therapy is trying to extinguish” (Paris, 2002).

Improvement of health and healthcare infrastructure are among the most remarkable demographic changes of the past century. The life expectancy has doubled from around 30 years in 1900 to 66 years in 2005, and is projected to rise to 81 by the end of this century, as whole world (Krishnamoorthy, 2008). An important reason for improve life expectancy has been due to improve health and health care infrastructure, or because of declining in infant and child morality due to health interventions related to improved nutrition, water and sanitation, and to medical interventions such as vaccine coverage and the use of antibiotics. Good healthcare systems characterized by the ‘accessible’, ‘affordable’ and ‘acceptable (Krishnamoorthy, 2008). In the first half of the 20th century, infant mortality was low in rich countries, while rates remained very high in developing countries. The second half of the 20th century saw large improvements in

infant mortality, even in very poor countries. It is also due to reduction of age specific death rate (ASDR) at the middle and older ages. These reductions are typically associated with improvements in medical technology, life style changes, and income growth (Bloom and Canning, 2008). There is undoubtedly a relationship between income and health, with higher incomes leading the better health and lower mortality (Preston, 1975).

A sharp rise in lifestyle diseases such as heart problems and stroke, coupled with a lack of adequate preventive health care, threatens India's future growth prospects. Pollution, depression, the fast pace of modern life, stress at work and unrestricted use of junk food were blamed by heart specialists and the highly competitive nature of modern life everybody was in a hurry so much so that people did not have the time to pay adequate attention to their health (Anonymous, 2007). Different cultures and social classes some times pattern unpleasant effects, such as depression, in different ways. This tends to be more common among poorer social classes- blue collar workers with high school education of less, and who have more traditional lie styles (Helman, 2007). A survey on "*Impact of Preventive Health Care on Indian Industry and Economy*" was conducted by the Indian Council for Research on International Economic Relations (ICRIER) New Delhi. The survey shows a quarter of Indian firms lose about 14 per cent of their annual working days due to employees' sickness, it is not only heart ailments, but also mental stress, trauma, and skin problems that are causing the productivity decline among the staff. The report indicates a strong relationship between preventive health care and corporate profitability. The heart disease, stroke and diabetes are estimate to have wiped \$ 9 billion of India's national income in 2005, but the losses could total a staggering \$200 billion over the next 10 years if corrective action is not taken quickly. Indian Council of Medical Research (ICMR) reported over 6800 cases of cancer every year. The National Health Policy, 2001 emphasizes that, levels of morbidity and mortality are high in India.

According to WHO, more than 50 per cent of cancers occur due to smoking, diet, infections and change in life style and most of the hospitalized cases were due to Cancer. India has more cervical cancer cases than any other country in the world (130,000 new

cases are reported every year) and cervical cancer is the number one cause of cancer related death among women in India. The primary cause of cervical cancer is “human papilloma virus” or HPV. In North America and Europe, the HPV vaccines are available, but not in India. These HPV vaccines can protect women against the HVP, responsible for about 70 per cent of cervical cancers (Gupta, 2008).

1.2. Concepts of the Ailing and Hospitalization

The concept of ailing and hospitalization is that it differs in individual to individual and/ or within social group and religion. It also differs in different socioeconomic conditions.

Health and illness are the most important issue in the discussion about hospitalization. A layman often says that illness occurs due to curse of God and good health is the blessing of the God. They also believe that cause of illness is due to over diet and under diet. There are two types of nutritional disorders, i.e. over nutrition and under nutrition. Both conditions show the path of hospital. In higher social-economic groups family members suffer from over nutrition. Dr. Swaminathan (an agricultural scientist) and Dr. Ramchandran a nutritionist expressed concern over malnutrition and its results. Ogden (1997) explain the eating behaviour in the form of theories that regarded the individual as passively external food cues and later theories emphasized the processing that food intake resulted from an interaction between individual and their environment. And recent theories describe eating in terms of self-control, self-efficacy and self-regulation. This is particularly salient in theories of overeating in normal weight individuals and eating disorders.

Ill health as a major development deficit and violation of human rights would not be out of context in the Indian public health scenario, which is still grappling with sharp rural-urban, gender and interstate variations. Illness describes a subjective state whereas sickness describes a state of social dysfunction that affects relations with others. Sickness is synonymous neither with illness nor with disease, although it includes both. The

crucial distinction from sickness is that both illness and disease affect the individual organism and are confined within it, whereas sickness refers as state for social dysfunction that affects the individual's relations with others. Impairment refers to a persisting physical or psychological defect in individual, and disability means to persisting physical or psychological dysfunction (Susser et al, 1985, p-16). Many diseases do not have an issue to hospitalize and death. Mortality rates cannot show the impact of acute minor ailments such as respiratory and gastrointestinal infections, which are the commonest of all causes of sickness (p-65). In childhood the bulk of illnesses are acute infections. Respiratory disease accounts for nearly 28 per cent of hospital admissions in the United States for those who are below 15 years.

1.3. Health Care Service

The progress and gains in some of the major indicators of health in India in the post-colonial period have not been insignificant. The prevailing public sector health infrastructure consists of a three-tier structure with around 3000 community health centers, 2300 primary health center and 1,37000 sub-centres spread in semi-urban and rural areas. Tertiary medical care is provided at multi and super specialty hospitals and medical colleges. There are around 5 lakh doctors, 7.4 lakh nurses, 3.5 lakh chemists, 1600 hospitals and 870,000 beds. In comparison to other developing countries India is behind in the health facilities. India has merely 94 beds per 100,000 persons as compared to the minimum of 333 beds prescribed by the World Health Organization (WHO). According to health infrastructure surveys carried out by the International Institute for Population Science, Mumbai, only 69 per cent of the primary health centers have at least one bed and only 12 per cent have been found to be in a state of perfect maintenance (Prasad and Sathyamala, 2006).

There are three main sources of health care services in India such as public hospital, private hospital and traditional health care. It is interesting that in modern age 8 per cent of the population of the developing countries rely on traditional medicines, mostly plant drugs, for their primary health care needs (WHO). In modern source of

medicine, about 25 per cent drugs derived from the plants and many others that are synthetic analogues built on prototype compounds isolated from plants. The demand for medicinal herbs is increasing in both developing and developed countries due to growing recognition of natural products, being non narcotic, having no side effects, easily and affordable for poor. There are many rural residents using medicinal plant as self-treatment (Chakravarty, 2008). McKeown (1979) explained the medical contribution in decline of mortality, and he also explained the protection of diseases by immunization and therapy. Immunization helps to prevent the some infectious diseases. Medical treatment may also influence infectious diseases by serum transfer, as treatment of diphtheria with antitoxin; or by therapy, which acts directly on the microorganism, as in the case of sulphonamides and antibiotics.

The public sector health system created, run and maintained by the central and state governments and covers national disease control programmes. Public health programmes are concerned mainly with preventive, promotive and rehabilitative aspects giving importance to primary health care. The government concentrates on basic primary health care whereas private sector covers secondary and tertiary health services. Health sector has received just 3.33 per cent share from the total outlay during the First Five Year Plan. This has decreased to 3.0 per cent during second plan and during eighth plan to just 1.75 per cent. It is indicated that the health sector has been neglected by the government. Hence, there is utmost need for investment in health and other social sectors to improve the quality of life (Uma, 2004).

India has created a vast health infrastructure such as Sub-Centres, PHCs, and CHCs with qualified doctors. The rural population covered by Sub-Centre, Primary Health Center (PHC) and Community Health Center (CHC) are 5000, 30000 and 120000 in general national norms and 3000, 20000, and 80000 in tribal areas population (Rural Health Statistics in India, 2002). CHC is the top and sub-center is the lowest health care unit in rural health infrastructure. There are three main dimensions of modern PHC: promotive, preventive, and curative health care. Each has a definite relevance to the state of health and they can also be further split into the various components. On the basis of

the criteria used, demarcations can be made so, to study the various components within a cultural and socio behavioral framework. There are some cultural factors that affect the health of people like nutritional balance and adequacy, clean and potable water, public hygiene and sanitation, private and household hygiene, mass immunization, post symptomatic prevention of locally endemic diseases and care and treatment of the ordinary and chronic sickness. The specific types of immunization undertaken by the health administration are BCG, DPT, Oral polio, and Measles for children and tetanus toxoid for expectant mothers (Sushma, 1990).

The private sector is the most important source of healthcare services in India, providing close to 80 per cent of all services, according to the governments own account. A related fact is that nearly 75 per cent of health related expenses are out of pocket and occur at the point of service delivery (Das, 2007). The healthcare delivery is primarily the responsibility of national governments. Public-Private Partnership come in diverse forms and can mean different things to different people (Asante and Zwi, 2007).

Sushama (1990) reported the factors identified for better health care mainly health intervention programs based on western ideas of health and hygiene and utilization of these facilities by the people.

1.4. Ailing and Hospitalization in India

Low hospitalization is reported in India because traditionally the villagers used the ayurvedic system; home made herbal medicines and magico-religious practices cured the sick. The ayurvedic system is the traditional medical system used in India for more than 3000 years and according to this system, sickness is caused by the imbalance in bodily humours. Extracts of plants are used to treat the sick and this type of treatment is widespread in the state. The commonly reported sicknesses were colds, coughs, fever and headaches, rheumatic pains, skin diseases, asthma, bronchitis, chicken pox and injuries, symptoms related minor respiratory ailments were common and it was confirmed by the doctor in the village that respiratory illnesses are more common than

other ailments. There were some chronic cases of mental disorders, which were being treated, in a psychiatric institution. Generally, people used western medicine to cure illnesses. Of the persons reported sick, 56 per cent used western medicine, 18 per cent used ayurveda and 16 per cent used homoeopathic medicines as the first step to cure their sickness. The rest used magico-religious practices and self-medication to cure illness (Sushma, 1990).

What most physicians have taken as given about disease, social science takes a holistic picture. For the physician the goal of practice is to cure or care for the individual afflictions caused by disease. Social science goes beyond the individual human body and the individual psyche. It inquires into the social dimensions of affliction in two senses: how disease originates, and how it makes its appearance in a society at a given time. And what types of the ailments and economic conditions of the patients influence to hospitalization. Therefore, economy, ecology and disease are inter-related and influence to admit in hospitals (Susser, et al. 1985).

The National Sample Survey Organization (NSSO) was set in 1950. It provides information completing the census data, and also provides information on the aspects which are not covered by the census. The NSSO survey on morbidity, health expenditure, health care services utilization and nutrition are very useful sources of data related to health. Morbidity has been covered in nine rounds of the NSS, while disability has been covered in six rounds. In the first morbidity survey (1953-54) in the seventh round, the sample consisted of only 8253 rural and 1720 urban households. In the 1950s there were four reports on morbidity, two in the 1960s, one in 1970s and two surveys in 1980s which covered utilization of health services also. The major limitation of the NSS data on morbidity is the changing extent of coverage and methodology of collecting information which renders the data for different rounds incomparable (Srivastava, 1999).

In the survey of NSSO 52nd round data was collected during June 1995 to July 1996 and 60th round data during January to June, 2004. The information regarding hospitalized during 365 days were collected in the block 4 of the questionnaire. The

response categories were 'Yes' and 'No'. Hospitalization is defined as "if one has availed of medical services as an indoor patient in any hospital". Hospital, for the purpose of survey, refers to any medical institution having provision for admission of sick persons as indoor patients (inpatients) for treatment. Hospital covers public hospitals, community health centres and primary health centres (if provided with beds), ESI hospitals, private hospitals, nursing homes, etc. In this context it may be noted that admission for treatment of ailment and discharge thereof from the hospital will be considered as case of hospitalization irrespective of the duration of stay in the hospital. It may also be noted that hospitalization in the cases of normal pregnancy and childbirth will not be treated as hospitalization. They also asked the number of times hospitalized. They were further asked whether household member ailing 15 days and one day before the survey as in same responses ('Yes' and 'No'). According to NSSO the definition of ailment (illness or injury) means any deviation from the state of physical and mental well being. An ailment may not cause any necessity of hospitalization. An ailing member is a normal member of the household who was suffering from any ailment during the reference period. In the survey, one will be treated as sick if one feels sick. This was also include among other things such as cases of visual, hearing, speech, locomotor and mental disabilities; injuries were cover all types of damages, such as cuts, wounds, haemorrhage, fractures and burns caused by an accident, including bites to any part of the body; cases of abortion - natural or accidental. In the survey cases of sterilization, insertion of IUD, getting MTP etc; cases of pregnancy and childbirth were not included. The detailed description of ailing and hospitalization and its factors are discussed in chapter 4.

According to the survey of the NSSO 52nd and 60th round, as given in table 1.1, there were 1.4 per cent and 2.4 per cent of the population hospitalized during 365 days. And majority (90.1 per cent) of them was recorded as one time hospitalized and rests were two and more than two times hospitalized. The 24.6 per cent and 19.5 per cent in earlier survey (52nd round) and 30.1 per cent and 36.0 per cent in later survey (60th round) were ailing one day and 15 days before the survey respectively.

Table 1.1: Percentage reporting Hospitalized and Ailing in India, 1998 and 2006

Particulars		52nd (1998)	60th (2006)
1	Hospitalized during 365 days	1.4	2.4
2	Number of time Hospitalized during 365 days		
	One Time	90.0	90.1
	More than two times	10.0	9.9
3	Ailing Person Within Hospitalized		
	Ailing before one Day of Survey	24.6	30.1
	Ailing before 15 Days of Survey	19.5	36.0
	Total	84039249	23014833

Source: NSSO, 1998 and NSSO, 2006

There are number of factors that influence ailing and hospitalization like Demographic (Age, Sex, residence), Social (religion, social group, and marital status), Household (Structure, source of drinking water, water treatment, availability of latrine, drainage facility and source of energy for cooking), and Economic (Education, Activity status and land holding). Some studies have been carried out describing the fact on that influence ailing and hospitalization. But, at the all India level ailing and hospitalization have not been examine in detail. In the study we examine the various factors that influence ailing and hospitalization in India, using NSSO's 52nd round (1995-96) and 60th round (2004).

1.5. Objectives

- 1- To describe the population who were ailing and those who have been hospitalized.
- 2- To examine the influence of various factors on ailing and hospitalization.

1.6. Organization of the dissertation

This dissertation consists of five chapters namely – Introduction, Literature Review, Conceptual Framework and Methodology, Results and Discussion, and Conclusions. In the first chapter we have described the nature of ailing and pattern of

hospitalization cases, and concepts of hospitalization on the basis of past studies. Literature review is given in the second chapter. In the third chapter we have described the conceptual framework for the study, proposed hypotheses, methodology such as data source, presentation of the data, statistical tools, study variables and methodology used for the analysis of the data, and area of study and limitations of the study. The fourth chapter is based on our findings of the study, and the final chapter relates to conclusions of the finding.

In next chapter we have review literature which is relevant for the study.

Chapter 2

Literature Review

Chapter 2

Literature Review

In this chapter we review research that has been conducted on ailing and hospitalization and factors that associated with these. The review literature is presented under four major sections. These sections are:

- 2.1 Demographic Factors
- 2.2 Social Factors
- 2.3 Household Factors
- 2.4 Economic Factors

2.1 Demographic Factors

One of the important factors that influence ailing and hospitalization is the demographic variables. Age, as is well known, influences ailing and hospitalization- old persons are more susceptible to diseases and are to be hospitalization. Similarly other demographic factors such as sex and residence influence ailing and hospitalization.

Speizer et al., (2006) reported, respiratory infections, as a class that represents serious pneumonia and influenza, were 120 deaths per million men and 76 women worldwide for the 15-59 age groups. They also emphasized, the lower respiratory diseases is around 10 times higher in people age 60-69 than in people age 15-59. “In contrast to other adult respiratory diseases, the prevalence of asthma is relatively low. In adults, the DALY’s for asthma are at a peak of about 2 per cent of the total worldwide in people age 15-29. This pattern is also reflected in mortality rates, with the highest rates occurring in young people and equal rates in men and women about age 60”.

In India, 167 million people are suffering from iodine deficiency disorders, about 54.0 million of them have goitre and 9.0 million have mental/motor disorders. This study

was conducted in state Gujarat, India, in 6-12 years school going children. According to Misra et al., (2007) prevalence of goiter was higher in 9-12 years age group as compared to 6-8 years age group. "The median iodine concentration was 70 ug/l. showing insufficiency (mild iodine deficiency) goitre prevalence was 20.5 per cent indicating moderate iodine deficiency in school going children.

Most demographers interested in the study of elderly persons think that health is an appropriate segment of demographic study and surely there are some interrelating between health of older people and demographic changes (Seigal, 1980). Kinsella and Phillip (2005) also remarked that a successful life is absolutely dependent on healthy ageing (ability to remain physically and mentally fit). Nath et al., (2007) conducted a study on "Health problems of elderly population in Assam and their correlates" and emphasized that in village elders had faced problem in walking, hearing, vision, joint pain, and cough problem at age 50 years or before. There were 2.3 per cent elderly having eye problem and cough problems. The problems of the hearing and joint pain faced by 13.3 and 17.1 per cent respectively. Multivariate analyses showed that 42.2 per cent have an increased chance of having good health than the elderly suffering from vision problem. The odds ratio of having good health to the elderly who are free from cough problem is 1.79 as compared with the elderly suffering from cough problem. An elderly free from having pain has 40.1 per cent increased chance of having good health than the elderly suffering from joint pain, and 49.7 per cent to the elderly for good health who are free from hearing problem in comparison to the elderly suffering from hearing. The main cause of tooth loss in the elderly population was chronic periodontitis diseases (Gunes, et al., 2008).

India, as the rest of the developing world, is urbanizing rapidly. India's urban population grew by about 32.0 per cent during the decade 1991-2001, which is higher than the rural rate of 18.0 per cent. The utilization and reach of primary health services is poor among urban slum communities in India even though there is an advanced health facility (Agarwal et al., 2007). They also showed that among the urban poor in India, only 24.8 per cent of mothers receive completed antenatal care. Under nutrition and

stunted is an important factor contributing to poor health in urban slum communities. Another factor they have been emphasized that poor health among slum dwellers is the low awareness and practices of recommended health practices, hygiene and sanitation. The poor persons have faced higher mortality, under nutrition and other serious ailments than rich, and prevalence of diseases like diarrhoea and anaemia is high in low-income households' children. The poor have very low in health care access when they were ailed (Gupta and Dutta, 2003).

A study conducted in Gujarat (Gumber and Kulkarni, 2000) based on household survey and finding shows female morbidity turns out to be higher than its male counterpart in the entire population group. As expected, both rural and urban areas, the private sector has played a dominant role in providing services for ambulatory care (acute and chronic morbidity). Even among the ESIS households, particularly in rural areas, there is greater reliance on private facilities for the treatment of acute illnesses. In urban areas only 54 per cent acute and chronic ailments of the insured population were treated at the ESIS facility (Gumber, 2007).

Babu and Holgate (2002) reported that over the past 20 years the prevalence and severity of asthma has increased not only in the developed countries but also in the third world. In the Western Europe asthma has doubled in the last 10 years and in the US it has increased by over 60 per cent since the 1980s. In India prevalence of asthma in children varies from 10-15 per cent and 20-30 per cent in Brazil.

Ghosh (2005) studied on "Does Economic Inequality Matter in Cases of Infectious Childhood Diseases?" has included six diseases (Diarrhea, ARI, T.B., Malaria, Jaundice and any Infectious disease) and found that prevalence of ARI and Malaria are higher in rural areas than in urban areas and does not vary much according to type of structure, also reported the prevalence of diseases varies significantly according to the Standard Living Index (SLI), and stated that high prevalence of diseases among lower standard living as compared to higher standard living index. The demographic factors usually influence both ailing and hospitalization. For example, male child of older

women from higher economic household, suffer more diseases than female child. The prevalence of diseases among the children is higher, whose mother was illiterate, and suffering from anaemia. The prevalence of infectious diseases was higher among non Hindu rural resident. The economic condition of household is a significant predictor of infectious childhood diseases that may occur after early infancy, and household economic conditions, the covariates most subject to intervention is geographic region, maternal education, and work status of the mother.

In the Department of Dermatology Regional Institute of Medical Sciences Imphal, India, Devi and Zamzachin (2006) showed that Eczema emerged as the common group of disorders (17.48 per cent) followed by fungal infections (17.19 per cent), pyodermas (9.10 per cent) and scabies (8.97per cent) Dermatophytosis (13.82 per cent) was the common fungal infection followed by Pityriasis versicolor (3 per cent), Candidiasis (0.33 per cent) and deep mycosis (0.02 per cent). And Acne vulgaris (6.06 per cent), urticaria (5.68 per cent) and viral infections (3.78 per cent) were the other major disorders. Hansen's disease and tuberculosis of skin formed 0.04per cent each of the total cases. Kutty's (2007) study in Kerala showed that the State is already well advanced in the Epidemiological Transition. This is the shift in mortality pattern from one dominated by communicable diseases to one where non-communicable diseases, accidents and homicides increasingly pay a leading role. There is evidence to show that heart disease, diabetes and strokes are leading causes of death, their rates approaching western levels. Breast cancer is already a leading cause of hospital admission among women. Micro level studies have shown that in the rate of female suicide, we lead in the world. Accident rates are also among the highest in India.

Alam (2007) reported that in India the elderly face a very high burden of diseases. Notably, these diseases are not clear like non-communicable, stress or life styles related and include both communicable and non-communicable diseases. Also reported that a high rate of sickness among the urban than the rural women. One of the most prevalent old age conditions in India is a joint problem. The highest proportion of the aged, suffers from this problem, especially in rural areas. Next to this are respiratory diseases. Irregular

blood pressure is yet another condition, with a very high prevalence in urban areas. With time, this problem is increasing among the rural aged.

Chronic Obstructive Pulmonary Disease (COPD) continues to be a big health care problem in India where along with asthma it constitutes the second largest causes of mortality in rural areas. Chandra et al., (2007) study shows out of 94 patients, 47 patients suffered from co-morbidities. Among them, hypertension was the most prevalent at 12.7 per cent, 10 patients suffered from pulmonary Tuberculosis. They also reported that hypertension at presentation was the only significant independent predictor of in hospital mortality.

Non-communicable diseases (NCDs) are easy to diagnose and provided treatment. The study by Anand et al., (2007) "Are the Urban Poor Vulnerable to Non-Communicable Diseases in Faridabad?" The result shows the mean body mass index (BMI) was lower in men than in women (20.9 v. 21.9 kg/m²). The prevalence of hypertension (BP>140/ >90 mm hg or on an anti hypertensive drug) was 17.2 per cent in men and 15.8 per cent in women. They also suggested that the high prevalence of risk factors for non-communicable diseases across all age groups in this urban slum community and the likelihood of a high future burden of illness. These diseases are responsible for a high proportion of deaths and disabilities. WHO, estimated that in 2000, NCDs and mental disorders caused 59 per cent of deaths and 46 per cent of the global burden of disease.

Prevalence of diabetes mellitus (DM) is increasing in epidemic proportions in Asian countries and it is 8 per cent and 13 per cent in rural and urban residents respectively in India. The patients suffering from diabetes were higher suffering from physical as well as psychological problems as compared to non-diabetic patients (Gulati and Juyal, 2007). Diabetes was also associated with risk of psychological disturbance (Peyrot and Rubin, 1997). The incidence of diabetes is 20 per 1000 person years (Prasad, 2008).

Balasubramanian et al., (2007) have evaluated an intermittent six month regimen in new pulmonary tuberculosis patients with diabetes mellitus and results show the association of diabetes did not influence the out come of tuberculosis treatment. Chadha et al., (2007) studied annual risk of Tuberculosis infection in Andhra Pradesh, India, and reported that among children 5-9 years of age the tuberculosis infection was 1.5 per cent.

The WHO has warned that the international burden of mental/psychiatric disorder already enormous and continue to grow. Based on the warning, Hosain et al., (2007) have been conducted studies in Bangladesh. They reported the overall prevalence of psychiatric disorders in the rural areas was 16.5 per cent. Depression and anxiety disorders constituted about one half and one third of total cases, respectively. They also reported a significantly higher prevalence of mental disorders increased with age. And poor were 1.23 times more likely to have mental disorders compared with rich.

The higher risk of Sexually Transmitted Infections occurs between both sexes and those who have sex with same sex. The study of Cochran and Mays (2007) shows that nearly 18 per cent of gay, bisexual and homosexually experienced heterosexual men reported prevalence of HIV infection and they had higher levels of psychological distress as compared to heterosexual individuals. They concluded that “lesbians and bisexual and homosexually experienced heterosexual women reported a greater variety of health conditions and limitation compared to heterosexual with exclusively heterosexual women. However, these differences mostly disappeared when distress levels were taken into account”. They also stated that psychological disorders affected both of physical illness and self-perceived physical health status.

The prevalence of anaemia was about 68.0 per cent among 12-14 years of girls. The only 9.4 per cent were having severe anaemia. Prevalence of anaemia was significantly higher in 12-14 years age group and association between anaemia and family size and anaemia and socio-economic states were also significant (Kokiwar and Saiprasad, 2007).

The etiology of cardiovascular diseases is multi-factorial and no single factor is an absolute cause. The factors such as family history, diabetes, obesity, hypertension, lack of exercise, stress strain and excessive smoking affect cardiovascular diseases. The study by Kaur and Bains (2006) revealed that 20 per cent and 56 per cent of the rural male heart patients were smokers and drinkers, respectively. They found 42 per cent of them were over body weight and 32, 22, and 34 per cent suffered from raised blood pressure, blood glucose, and cholesterol levels respectively.

Of all hospitalized cases at community health centre 60 per cent were due to diarrhea and 30 per cent due to pneumonia and at district hospital. Thalassemics requiring blood transfusion formed 21 per cent of inpatients at the district hospital. At the district hospital, diarrhea and pneumonia contributed 24.3 per cent and 4.6 per cent of all admissions. The other hospitalization occurred due to seizures, febrile illness, enteric fever and sepsis (Verma et al., 2007). Mariappan et al., (2007) studied on “Socio-economic factors as indicators of various risk groups for filariasis, in Cochin, Kerala, India”. In their study subjects were native with age group 10-70 years old. They revealed that three fourth of the total filariasis in carriers were staying in tiled houses, followed by concrete and in thatched houses. Among them 42 per cent were casual labor, 44.0 per cent were private sector employees and 14 per cent were government employees. Males were more affected than females, because males are more frequently exposed to mosquito bites due to out door sleeping habits, thereby the possibility of risk of getting infection is high. The thatched houses have filariasis vector higher than other types of houses. Casual labourers and private sector employees were affected by filariasis.

Leprosy is a chronic disease that mainly affects the skin, the peripheral nerves, mucosa of upper respiratory tract and eyes apart from some other structures. It is largely attributed to advent of multi-drug therapy (MDT). Leprosy is considered to be transmitted via droplet from oral and nasal mucosa during close and frequent contacts with untreated cases (Agarwal et al., 2007). Agarwal and others (2007) studied “socio-demographic profile of leprosy patients in two district of Western U.P.” and showed that there is statistically significant association between the male sex and higher prevalence of

diseases. Leprosy is known to favour male sex. The mean duration of disease was 22 months, 47 months, 16 months, and 23 months among unemployed, semiskilled, skilled and professionals respectively. They also reported, the younger age was associated with higher incidence of leprosy. Males were more affected than females. The state of U.P. has leprosy prevalence rates which are higher than national average.

Sleep apnea is defined as cessation of nasobuccal airflow for 10 second or more during sleep associated with a drop in arterial oxygen saturation of at least 4 per cent from the baseline. Sharma et al., (2002) studied “the sleep disordered breathing in chronic obstructive pulmonary disease” and results show the mean age was 54.2 years, and these 33 patients had respiratory failure. The poorest people are vulnerable to tuberculosis because of the living and working conditions but they move deeper into poverty as consequences of this disease. Kaulagekar and Radkar (2007) also reported that 58 per cent males and 42 per cent females reported as suffering from tuberculosis. Reporting of tuberculosis is significantly more among males having low standard of living schedule tribes from rural areas and illiterate population. They also reported that for females, as age increases, treatment access goes down. Treatment seeking for currently married women is less frequent than that of all other women. The share of tuberculosis infection in females is about 40 per cent.

Kiviruusu et al., (2007) studies on “psychosocial resources and depression among chronically ill young adults. The result significantly shows that chronically ill males were more depressed than the healthy conditions whereas among females there is no difference in depression. They also explain that among five illnesses group (Diabetes, Asthma, Migraine, and Other Condition, two or more condition) males were more depressed than females. A similar study also reported the prevalence of chronic cardiovascular diseases were more among men than women. They also found that 25-39 year age group suffered more than old (60-74) in both the sexes (Ho et al., 2007b).

Low-back pain was the first symptom reported by 53 per cent of the patients, and most common extra-articular disease manifestations were psoriasis (25 per cent), anterior

uveitis (16 per cent) and intestinal inflammatory disease (4 per cent). There a some kind of work disability reported by 25.5 per cent patients (Collantes et al., 2007). Mental health problems are common: one in six people will have depression at some point in their life, with it most commonly occurring among people age group 20-44 years. But it is not that people suffering from mental health issues don't want to work. Only 24 per cent of adults with long-term mental health problems have jobs, the lowest employment rate for any of the main group of disabled peoples (Woolnough, 2007)

2.2 Social Factors

Like the demographic factors the social factors also influence ailing and hospitalization. Below we described some of the literature that report on social factors.

Sinha (2007) studied "morbidity and untreated illness" by using NSSO survey and observed that non-scheduled persons have reported higher episodes of illness, both in rural and urban areas; and it is not significantly different from those of the scheduled populations. He also reported that all India figures for the rural areas suggest that the ST males reported higher morbidity than both the SCs and others. Similarly, in the urban areas of Bihar, STs reported higher morbidity rates. He also emphasized that SCs availed themselves of higher proportion of outdoor treatment than their share in the population. In Bihar private health facility is high prevailing and the poor used the outdoor treatment largely available through the so called RM clinic and doctors. The rich depend on the qualified rural medical practitioners who are very expensive. The share of other diagnostic services varies with residents. X-rays, ECG and other diagnostic facilities including pathological tests are absent in majority of the government hospitals located in the urban area, let alone in rural areas. Two-third of STs sought hospitalization in public hospitals while a larger proportion of the non-scheduled population prefer for private hospitals and over 10 per cent of all hospitalization cases among the STs were reported from the Primary Health Centers (PHCs).

STI/RTI is a global health problem among women. The study on “Prevalence of Lower RTI among Married Females in the Reproductive Age Group (15-45 years)” showed 40.5 per cent suffered from reproductive tract infection and 26 per cent had bacterial infections (Bansal et al., 2001). They also reported that RTI among females of Hindu and Muslim is not much different. The highest RTI was recorded in the age group of 21-30 years. They further reported that 32.5 per cent of them had not received any treatment or cure (Rathore et al., 2006). In Kathmandu 94 per cent of the women suffered from some problems or illness either during pregnancy or during labour and delivery. Most of them reported vomiting, edema and urinary problems (Smith et al., 1996). Williams, et al., (1997) reported that reasons for hospitalization are bacterial infection (22 per cent), fever (17 per cent) and malignancy related complications (12 per cent). Hospitalization rate varied based on HIV risk behaviour. “For examples, person with Intravenous Drug use as risk factor were more likely than others to be hospitalized prior to an AIDS diagnosis”.

During the International Conference on Health and Development organized by Beijing University’s Center for Human and Economic Development Studies (CHEDS) on 26-27 October, 2006 at Beijing. Amartya Sen said in his Conference keynote address by emphasizing both the intrinsic as well as instrumental significance of good health for expanding human freedoms. He focused on six issues: First, Public spending on health in most countries and more specifically in China has remained woefully inadequate especially in comparison to Military Security spending. Second, many developing countries continue to suffer a heavy toll of poverty-related illnesses (such as tuberculosis, malaria and gastroenteritis arising out of lack of clean drinking water and proper sanitation) alongside the emergence of new epidemics like HIV and AIDS. Strict adherence to the Hippocratic principle, “first do no harm” may be a retrograde step is third point. Fourth, he suggested that the collapse of Rural Public health and Cooperative Insurance may be contributing factors in the slowing down of China’s longevity gains. Fifth, arguing that equity is comparable with incentives or medical research, Sen called for close scrutiny of drug pricing policies and the lack of incentives for Research and Development of cost effective remedies against neglected diseases of the poor. And last

he emphasized the social determinants of health and the direct role of equity in promoting good health (Chen and Kumar, 2007).

It is generally seen that hospitalization is affected by social, economic, racial and environmental factors (Devi and Zamzachin, 2006). Moazam (2007) had reported in Center for Biomedical Ethics and Culture of the Sindh Institute of Urology and Transplantation in Karachi, as many as 2000 kidney patients were being hospitalized in the country every year, over the last five years.

In India, 20 per cent patients were treated mental disorders in primary health care sector. The prevalence of mental disorder was 21 to 42.3 per cent. The factors influencing mental disorders are female gender, poverty, unemployment and lower levels of literacy (Avasthi, et al., 2008). They also emphasized that most of the consultation with doctors were related to gastrointestinal system (15 per cent) followed by cardiovascular (11 per cent), pains (11 per cent) headache (10 per cent), respiratory (10 per cent), endocrine system (9.0 per cent), bones ad joints (5 per cent) and others diseases symptoms. A fewer of them reported for psychological nature.

Das (2007) observed that Orissa has a tribal population larger than the national average. They contribute 8.0 per cent of the country's population and 22.0 per cent of the state's population. They have worse health outcomes and less access to health care. They suffer more from pre-transition diseases; nutritional deficiency diseases and sickle cell anaemia are specific to them.

Fazenholz, et al., (2007) studied the "Increasing U.S. Hospital Admissions for Acute Pancreatitis, 1988-2003". They reported that the patients aged 40-49 year were positively associated with hospitalization. The hospitalization cases were higher among black than white, but it is not so different for sex or U.S. region. Among them 63 per cent were admitted through the emergency department and 55 per cent were urgently admitted. The mean duration of hospitalization was 6.9 days and it decreased from 8.2 days in 1988 to 5.8 days in 2003. The cases of hospitalization for renal failure and

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respiratory failure were recorded as 3.2 per cent and 2.5 per cent respectively. The multivariate logistic analysis reported increasing age and male to be risk factor for death during hospitalization.

Hepatitis C Virus (HCV) was first discovered in 1989. In India, the prevalence of HCV infection ranged from 0.12 per cent to 0.68 per cent in general population. Pukhrabam et al., (2007) studied the pattern of hepatitis C virus genotypes in HIV infected patients in Imphal, Manipur. They show the HCV usually occurred in the age range of 21-40 years. Among them married were higher percentages than those unmarried. Among male and female different genotype affected. The infections of RTI/STIs represent major public health problems in developing countries. In Indian community it ranges 39-84 per cent. A study was conducted on prevalence of RTIs/STDs among married women in the reproductive age group of (15-44 years) in a rural area of district, Sirmour (Himanchal Pradesh). The finding shows, RTIs/STIs were negatively related with education. The Prevalence of RTIs was less among women having no children and the difference was significant. Higher prevalence was among women having one or two children and it did not vary during subsequent deliveries. Women who used condom and oral pill were less affected. Apart from vaginal discharge, which was the commonest symptom and many suffered from menstrual problems, low backache and burning maturation. Some reported more than one reproductive morbidity (Sharma and Gupta, 2007).

The situation of widows is such that there is a strong feeling of physical and emotional pain of separation and consequently mental depression, social exclusion and economic dependence on others. In addition to this, poverty and under nutrition leads to health hazards. "Man made factors like wars and terrorism increase the incidence of widowhood in a population" (Swain et al., 2004, p, 173). In India, 26 million are widows and among them 22 per cent each belong to the age group 15-49 years, and 50-59 years and rest (56 per cent) are 60 years and above. The highest per cent of widows are in Goa, and in contrast to this Assam has lowest. According to Swain et al., (2004) rural regular smoker widow suffer more from asthma and positively correlated with age whereas

education and household Standard of Living Index (SLI) is inversely correlated. The prevalence of malaria was higher 'among' low household SLI and illiterate younger age group, and associated with living place, SLI and education. Jaundice was not significantly different from currently married. They also reported higher prevalence of asthma among widow in all the states, but, T.B. was highest in Bihar and lowest in Himanchal Pradesh whereas Malaria and Jaundice reported highest in the North East India. The logistic regression analysis shows education of widow was the main link with all the diseases (Asthma, T.B., Malaria and Jaundice) and smoking and SLI are strongly associated.

Sidhu et al., (2008a) studied Malnutrition and Anaemia among Schedule Caste women of Amritsar (Punjab). They reported that around 43.0 per cent adult females are normal, 45.0 per cent are underweight and 12 per cent are overweight and obese. Under nutrition is higher among rural schedule caste females and overweight and obesity among urban females. And 56.0 per cent urban and 51.0 per cent rural schedule caste females are affected with various grades of anaemia. Obesity is a common problem in developed countries; it is recognized as a major health problem in developing countries and countries undergoing economic transition (WHO). The childhood obesity is related to long term effects on mortality and morbidity. Prabhjot and Sidhu (2008) further studied "Prevalence of obesity among school going children of Amritsar" and they found that the overall prevalence of overweight and obesity among boys was 7.4 per cent and 2.2 per cent respectively whereas among the girls it is 6.5 per cent and 3.5 per cent respectively and it is statistically significant. The prevalence of overweight and obesity is as high as some developed countries. Sidhu et al., (2008b) again reported overweight and obesity among males and females is 46.2 per cent and 58.6 per cent respectively. The prevalence of hypertension and diabetes mellitus is very high in Punjab. Overweight and obesity independently confer an increased risk of morbidity and this risk begins to rise at BMI greater than 2kg/m².

2.3. Household Factors

An important reason for occurrence of diseases, especially those that are exogenous in nature, is the household characteristics. Members of the households that are endowed with better water and sanitation facilities generally tend to have lower incidence of diseases that are related to them. For example, occurrence of diarrhea among household members is directly linked with the use of clean water and hygiene. Under these factors, we considered the types of house structures, types of drainage, source of drinking water, water treatment, types of latrine, source of energy for cooking.

In India most of the patients suffer from attacks of Amoebiasis, Giardiasis and other infective Diarrhoeas that are attributable to socio-economic and environmental conditions such as poor sanitation and contaminated drinking water (Chakrabarti, 2007). The study by Manoranjithan et al., (2007) on “Perception about Suicide: A Qualitative Study from Southern India” shows that the most common causes for suicide were interpersonal and family problems, and financial difficulties. Mental illness was also reported as causal. A majority of the population who had attempted suicide was not aware of any community and support services for the prevention of suicide.

Indoor pollutants are exhaust vapour, gases, organic chemicals spores, allergens, micro organisms and various other substances. Fuel combustion, smoking, air conditioning, building and construction materials, paints, consumers' products, pets, plants and people living indoors are some of the sources. The LPG, Kerosene (pollutants) are major cause of respiratory diseases. Household gas cooking has shown relationship with the prevalence of respiratory illnesses in school children compared with a lower outdoor pollution. “Volatile organic compounds such as formaldehyde, which originate from building materials, furnishings, resins, cosmetics, paper products and other sources in the home significantly influence the air quality, responsible such as the sick building syndrome, mucosal irritation, neuro-behavioral impairment and carcinogenesis” (Jindal, 2007, p, 409).

Air pollution causes about 3 million deaths each year, and 5 per cent of deaths per annum in the world (Sharma et al., 2004). They have studied “Assessment of Impact of Environmental Pollution on Human Health in the City of Jodhpur, Rajasthan” The results showed, in Jodhpur, a majority of the people suffer from respiratory and diarrhoeal diseases. Out of all cases 61.0 per cent and 25.0 per cent cases were diarrhoeal and respiratory diseases. Most of the Indian population uses its everyday household energy needs on inefficient and highly polluting solid fuels, particularly biomass (wood, animal dung cake, and crop residues, coal and chips) and LPG and Gobar gas. Most of the sources of energy for cooking produce smoke into home and creating indoor air pollution. The consequence of this indoor air pollution is a chief cause of morbidity especially for children and women. Bruce et al., (2006) reported three main outcomes with sufficient evidence to include in the burden of diseases are acute lower respiratory infection (ALRI), chronic obstructive pulmonary disease (COPD), and lung cancer related to solid fuel in home. They also reported “approximately 32 per cent of this burden (DALYs) occurs in Sub-Saharan Africa, 37 per cent in South Asia, and 18 per cent in East Asia and the Pacific. In developing countries with high child and adult mortality, solid fuel use is the fourth most important risk factor behind malnutrition, unsafe sex, and lack of water and sanitation, and it is estimated to account for 3.7 per cent of DALYs lost. Esrey and Habicht (1985) claimed that “safe water is necessary but not sufficient for infant and child survival and suggest that safe water will not be important unless sanitation is also good”. Anderson et al., (2002) studied the “Environment, Access to Health Care, and Other Factors Affecting Infant and Child Survival among the African and Coloured Population of South Africa, 1989-94”. They have selected three factors related to infant and child survival- socioeconomic characteristics, access to and use of health care and environmental conditions. The analysis shows that high infant and child mortality in the African population is likely to be product of low maternal education in rural residence, lack of sanitation facilities, limited medical access. Household socioeconomic variables are significantly related to the infant and child death for both groups. And distance to health facility was not significant. The age of mother in rural residence is individually significant and only for the coloured.

Smoking and other forms of tobacco use impose a large and growing global public health burden. Worldwide, about 5 million people die as tobacco users annually (Jha et al., 2006). They also emphasized that the health consequences of smoking are often assumed to be widely understated. About one-half to two-thirds of long term smokers being killed by their addiction, half of all tobacco deaths occur at ages 35-69 years. "Worldwide, about 80 per cent of deaths among the 2.7 billion adults over age 30 involve vascular, respiratory, or neoplasm disease". Juster et al., (2007) emphasized that ban of smoking, improves the public's health. This study on "Declines in Hospital Admissions for Acute Myocardial Infarction in New York State, After Implementation of a Comprehensive Smoking Ban" was conducted with objective to know the effect of tobacco smoking in hospitalization cases. The result shows that hospitalization cases decreased by 8 per cent due to ban of smoking. They have explained that enactment of clean indoor air laws was associated with decline of hospitalization.

Some studies showed that health status, disease pattern and causes of death pattern are differing between migrants and native population. For example, the study by Ho et al., (2007a) explains that migrants were higher mortality rates for heart diseases, diabetes, infectious diseases and uterine cancer. The mortality differential higher for Hepatitis, Tuberculosis, Liver cancer and Asthma. They have lower percentage in lung and colorectal cancer, pulmonary diseases, suicide and injuries than native population. They also reported, migrants had extremely low mortality rates for stomach, skin and oral cancer and alcohol related diseases compared with native.

The survey by Scott et al., (2007) in Ghana, found that only 4 per cent of mothers washed hand after defecation and only 2 per cent after cleaning child's bottom. And multivariate analysis, shows after defecation, mother's education, knowledge of important times to hand wash with soap, the age her children, and a measure of the quality of child care were all associated with hand washing. They also stated that hand washing with soap represent highly effective to limit the transmission of a range of diseases, including Diarrhoea and respiratory infections which together result in some small infant death globally each year. The hand washing with soap, especially after

contact with faeces, reduces diarrheal diseases by 42-47 per cent (Curtis and Cairn Cross, 2003). The hand washing can reduce the risk of acute respiratory infections (Ryan et al., 2001). Most of the people use soap because of bad odour, social acceptance and disgust of faeces and latrine (Scott et al., 2007). The reduction of 66 per cent child mortality rate under five by 2015 is one of the key goals of UN Millennium Development Goals. In the world more than 2 million people and most of them children died due to diarrhoea (Black et al., 2003).

The prevalence of any one symptom of RTI/STI is 24.1 per cent among currently married women in the age range 15-44 years in the Northeast states. The burning sensation lower abdominal pain and vaginal discharge reported 14.2 per cent and 9.8 per cent women respectively. Itching is reported by 30.0 per cent after that ulcer (4.2 per cent). The women who were suffering from RTI/STI 61.0 per cent did not take any treatment. The State Tripura reported highest prevalence of RTI/STI and followed by Sikkim, but it did not shows much different between rural and urban residents (Chellan and Kulkarni, 2006)

Asbestos is a term used for a number of naturally occurring minerals that have crystallized to form fibres. All type of asbestos fibres is potentially fatal if breathed in. The four main diseases associated with inhalation of asbestos fibres are: asbestosis, mesothelioma, asbestos related lung cancer and diffuse pleural thickening. And it can cause some other cancers (Anonymous, 2007).

Batty (2008) explained that how cyclone affected the disease pattern in that particular area. He emphasized that diseases like diarrhoea, cholera, and typhoid spread by water which is contaminated by flooding and broken pipes, sewage, toxins and ground water into the water supply. Lakes, plant debris, and streams are also dirty because they are littered with corpses. Stagnant water is a breeding place for the bacteria and mosquitoes. More than one third of child morbidity and death was due to water borne diseases.

The household food insecurity and under nutrition is an important issue in the developing countries. The improvements in economic conditions have benefited only certain privileged groups, and consequence of that is growing inequality in health and healthcare among the population. Hong et al., (2006) studied “Relationship between household wealth inequality and chronic childhood under-nutrition in Bangladesh”. This study showed that household wealth inequality is strongly associated with childhood adverse growth rate stunting. Reducing poverty and making services more available and accessible to the poor are essential to improving overall childhood health and nutritional status in Bangladesh. They also reported children in the poorest 20 per cent of households are more than three times as likely to suffer from adverse growth rate stunting as children from the richest 20 per cent of household. Age, sex, antenatal care, delivery assistance, birth order, nutritional status, education, household access to safe drinking water, toilet facility, cooking fuel, and residence were highly significant.

2.4. Economic Factors

Income and education is directly related to ailing and hospitalization. High income and higher educated person were more aware about the health, and they have better access to health care system. Some of the diseases are work related, for example, conjunctivitis disease occurs among the housekeeper and food service worker. The economic factors we considered are education level, activity statuses, and land holding.

The respiratory health problem among ethnic groups is associated with differences of income and socioeconomic differences among them. It is due to discrimination in terms of skin colour and education level. Breastfeeding is also associated with higher child respiratory problems (Miller, 2000). Boardman et al., (2001) studied the race/ ethnic differentials in respiratory problems, and they found that one tenth of the children less than three-year age suffer from respiratory problems, and among black non-Hispanic children it was reported 15.6 per cent. The odds ratio is substantial different between blacks and whites. The family income and respiratory problems are negatively associated.

Susser et al., (1985) reported that in childhood the bulk of illnesses are acute infections and exanthemata. Respiratory disease accounts for hospital admissions of 28 per cent under age 15 in the United States in 1980. The incidence of acute illness declines rapidly in adolescence, and then in old age. Out of these illness 70 per cent were presumed owed to infection and about 17 per cent to injuries. Children between 6-16 years lost on average 4.9 school days because of acute illness. Each employed person lost 4.9 workdays, and each person suffered 19.1 days of restricted activity and 6.9 days of bed disability. Enteric infections are borne by food, water and flies. Airborne diseases spread easily and rapidly in the conditions characteristic of poor, rapidly urbanized society's with over crowding, intimate social contact among large numbers and large proportions of susceptible young.

Prostate cancer is the most common malignancies in men and it relates social disparities. Its prevalence is lower among higher status men compared to lower status. Low social status can lead to psychological disorder and a consequence of this is prostate cancer (Nielsen et al., 2007). They also stated that incidence rate of prostate cancer among men who were educated was more than 12 years of formal education and widowed men.

For good mental and physical health, it is important for an individual that they must take full sleep (6-7 hours/ day). Short sleep creates, depression, incidence of diabetes, coronary heart disease, hypertension, obesity, etc (Stamatakis et al., 2007). Stamatakis et al., (2007) they studied "Short Sleep Duration Across Income, Education and Race/Ethnic Groups" and showed that characteristics associated with increased odds of short sleep included older age, non marital status, living in a rented residence, having one or more chronic conditions or ailments, physical inactivity, smoking, abstaining from alcohol consumption, consuming more than one alcoholic drink per day, depression and insomnia. They also reported that among six group of risk (age, living conditions, current health status, health behaviour and Body Mass Index, depression and insomnia), short sleep odds ratios were greatest among lower income and less than high school education.

International Labour Organisation (ILO) (2005) reported that the annual incidence rate was estimated to be 537 per 100,000 employees. The majority of the ocular injuries and illnesses resulted from foreign bodies in the external eye (incidence rate 194 per 100,000 employees). Incidence rates for superficial eye injury, atopic conjunctivitis, burn, and keratitis were 163, 31, 28, and 23 per 100,000 employees, respectively. The highest incidence rate was observed in the agricultural sector, with male employees having higher rates than female employees. Cooks, housekeepers, and food service workers had higher risk of atopic conjunctivitis compared with other workers. The majority of the atopic conjunctivitis illnesses and burn injuries were associated with chemical exposures. Sudarshan and Kaur (1999) studied "the relationship between tobacco industry and women's employment in West Bengal. The result showed occupation specific health problems among beedi workers including tuberculosis and other chest diseases. About 60 per cent of the women reported giddiness and headache, due to exposure to tobacco dust. About 36 per cent of them had eye problems like watering, burning, and 50-70 per cent of women reported gynaecological problems. Most of the women beedi worker also face the swelling of fingers and legs, and most of them reported back pain (Saravanan, 2001). The tannery work also affects health and 17.5 per cent of them suffer from skin diseases. Labour who were engaged in bleaching, calendaring, dying, sizing and power loom, suffered from fever, cough and eye sore cancer as compared to other diseases like breathing, lungs, ulcer and body pain and swellings (Ambavalan and Madheswari, 2001). The suffocating heat and smoke of the continuously burning ovens in room, which has little ventilation and a clogged chimney affects both the quality of product and the health of the workers. So, the work condition, living situation, health and hygiene are tightly interlinked, each influencing and reinforcing the other (Dewan, 2001).

The relationship between socioeconomic status and health is important for the study for all age groups. Chen et al., (2006) stated health changes with the age of the child. They also found that income and poor health more pronounced during adolescence for two acute conditions- accidental injuries and acute respiratory conditions. Case et al., (2007) commented a socioeconomic status and health in childhood. They stated that the

relationship between socioeconomic status and health varies with ages and not relevant to all age groups, because, after 18 years, they become economically independent and responsible themselves. The study by Smith and Goldman (2007) shows the relation of socioeconomic differences in health and found that in both areas (urban and rural) adults are good health, those are more educated and older.

The International Labour Organization (2008) reported in Asia growing of incidence of industrial accidents, work related illnesses and fatalities especially informal economic centre. Annually around 270 million non fatal accidents resulting in a huge loss of working days and agriculture, mining, fishing, construction, and logging are most hazardous sectors.

In this chapter we have revealed only a few articles in literature. But these articles are indicative of the influence of the various factors on ailment and hospitalization in India. In the next chapter, based on the literature review we developed a conceptual framework.

Chapter 3

*Conceptual Framework
and
Methodology*

Chapter 3

Conceptual Framework and Methodology

3.1. Conceptual Framework

A conceptual framework is a set of concepts, which are linked in an organized manner to establish nature, function, and relationship or conceptual frame and may be considered as a rational model (Botha, 1989). It is used in research to outline possible courses of action. It might, in computing terms, be thought of as a relational model. It is a type of intermediate theory that has the potential to connect to all aspects of inquiry (for example problem definition, purpose, literature review, methodology, data collecting and analysis). It acts like maps that give coherence to empirical inquiry.

In figure 3.1 we have explained the Commission on Social Determinants of Health (CSDH) conceptual framework (2005). This framework indicates that social and political context influences two determinants e.g. structural determinants of inequalities in health and social determinants of health. The structural or social determinants of inequities in health e.g. social stratification via education, labour market, income, and social cohesion; along with pathway or intermediary determinants or social determinants of health e.g. living and working condition, health behaviours, life course, health and social care are influencing the certain individual variables for the influencing incidences of disease and its cure. In framework from left to right, we see the social and political context giving rise to a set of differential socioeconomic positions. It direct as well as indirect that influence independent variables in hospitalization. Socio-economic position, individual's social position, differential health status, social inequities, differential vulnerability, differential health and well-being. And these factors influence hospitalization and differential access to health system. The certain variables groups are categorized according to income levels, education, professional status, gender, race/ethnicity and other factors. The socioeconomic position locates the underlying mechanisms can be described as structural determinants of health or as the social

determinants of health inequities. These mechanisms arrange the health facilities availed to social groups based on their placement within hierarchies of power, prestige and access to resources. They also observe that these socioeconomic positions then transform into specific determinants of individual health status reflecting the individual's social location with the stratified system. And based on their social status they experience differential exposure and vulnerability to disease influencing factors. This model shows that socioeconomic position affects his/her health, but this is not directly related. The working and housing condition, smoking also affect their health. This model indicates that lower social status individual's more frequently engage in health hazardous behaviour than more privileged.

A distinctive element of this model is its explicit incorporation of the health system. Socioeconomic inequalities in health can in fact be partly explained by the "feedback" effect of health on socioeconomic position, e.g., when someone experiences a drop in income because of a work-induced disability. Persons who are in poor health less frequently move up and more frequently move down the social ladder than healthy persons. This means that the health system itself can be viewed as a social determinant of health. This is in addition to the health sector's key role in promoting and coordinating SDH policy. " On this point the UK Department of Health has agreed that the health system should play a more active role in reducing health inequalities, not only by providing equitable access to health care services but also by putting in place public health programmes and by involving other policy bodies to improve the health of disadvantaged communities".

This model clearly shows that disease pattern and hospital admission of the individual's are influenced by certain factors and when these factors fluctuate it affects hospitalization. For example when the individual's income decreases, incidence of the diseases increases and their access to hospital treatment decreases. It is concluded that social, political, economical, health status, differential vulnerability, these are influences the hospitalization.

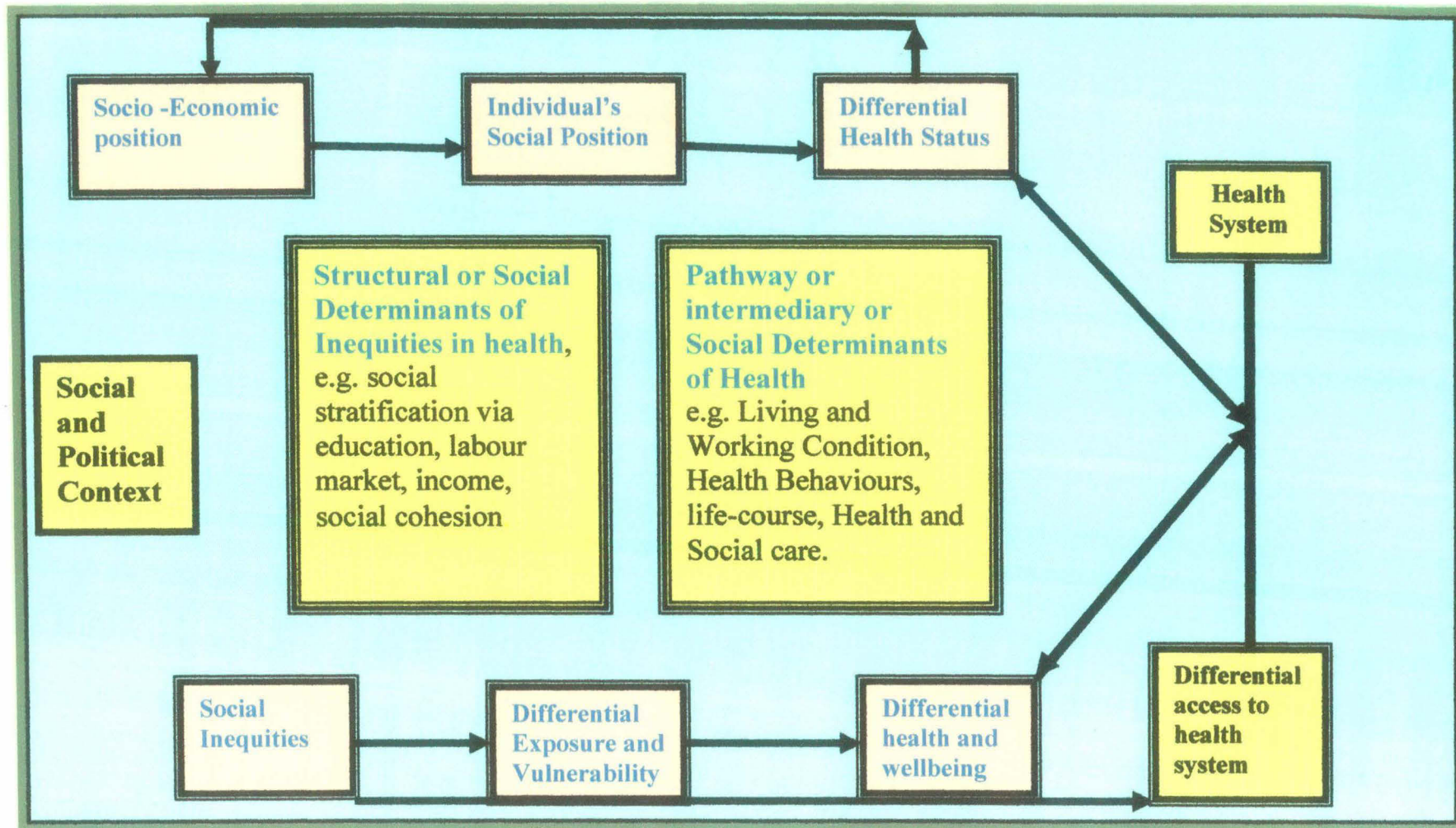


Figure 3.1: A Conceptual Framework for Disease and Differential Access to Treatment
 Source: CSDH, 2005

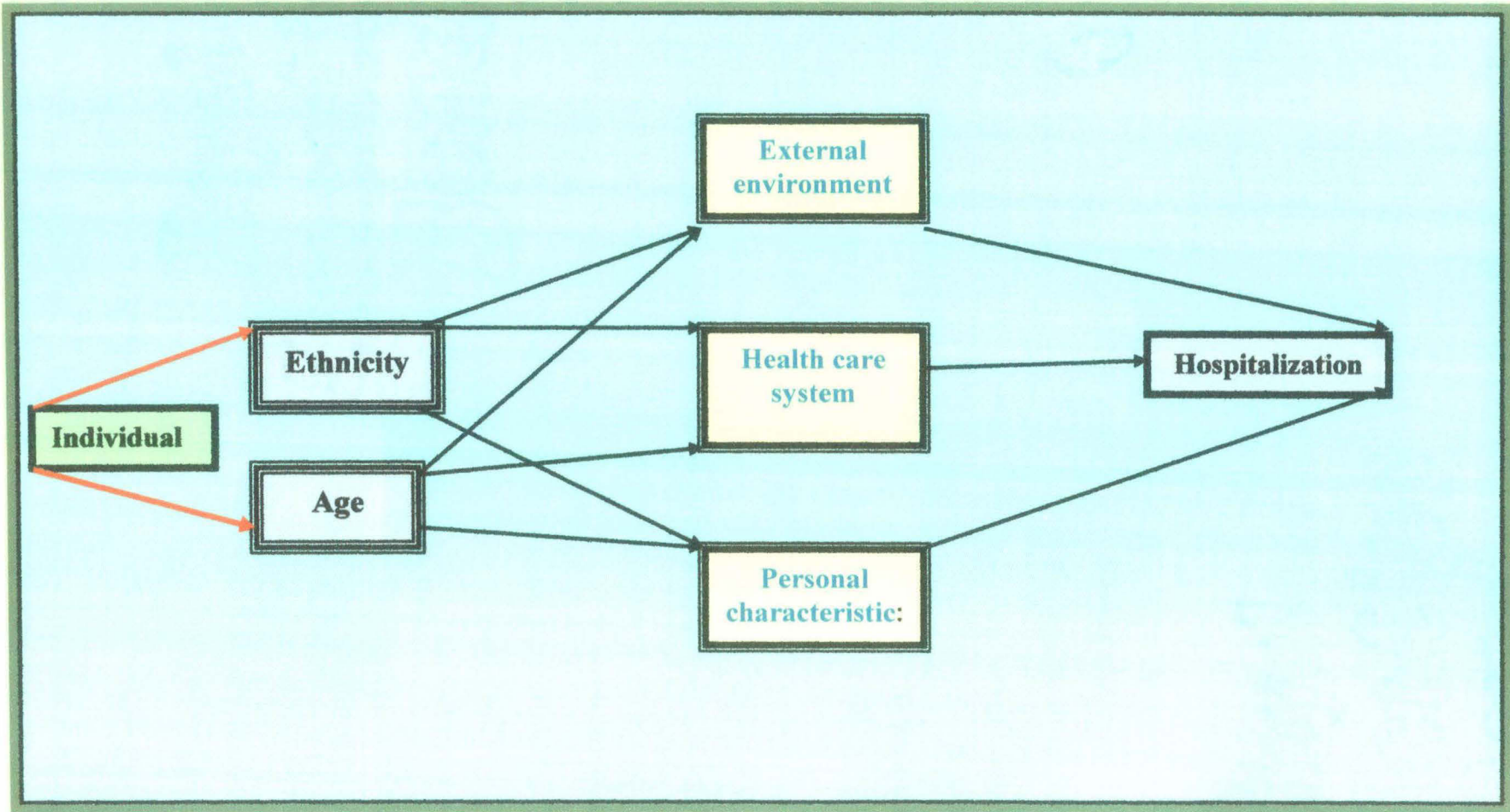


Figure 3.2: A Conceptual Framework for Ethnicity, Aging and Health

Source: Anderson and Davidson, 1997

The figure 3.2 shows that exogenous variable i.e. ethnicity and age are influenced ailing and hospitalization through external environmental, health care system and personal factors. According to Anderson and Davidson (1997) age influence ailing and hospitalization more than native population. They find that in the age group 35-44 of the migrant population compare with the native was hospitalized. Drummond et al., (1998) noted that age leads to the physical, social and psychological status of older persons and these influences ailing and hospitalization. Disability occurs more frequently in an aged population causing a reduction in usual activities, sleeping patterns, and body functioning (Gift, 1989). Personal factors of the person influence health. Marital status, gender, education level, occupational status influence ailing and hospitalization. Nevertheless, the lack of equity in healthcare is among the haves and have-nots in India, with education level and housing conditions. The focus must be that quality healthcare is a fundamental right and equity in healthcare, and how it will be achieved in India, this century (Krishnamoorthy, 2008).

After analyzing the above conceptual frameworks, we have proposed the following conceptual framework for examine ailing and hospitalization in India. This framework (figure 3.3) has been developed on the basis of literature review that presented in chapter 2.

For the analysis of hospitalization, 365 days before the survey. The data for the study is obtained from NSSOs 52nd and 60th round survey.

In figure 3.3 we have selected Demographic factors (age, sex, and residence) Social (religion, social group, and marital status) Household (type of structure, source of drinking water, water treated, types of latrine, drainage facility, energy for fuel and others) and Economic factors (education, activity status, land holding) health (ailments, ailing and hospitalized). The NSSO survey listed 38 and 41 diseases in the 52nd and 60th round survey report. We have grouped these diseases into 11 categories based on WHO classifications of the diseases (ICD-10). Among social factors like religion, castes and marital status shows the differential pattern of the diseases. Similarly household factors are directly related to the prevalence of the diseases and hospitalization.

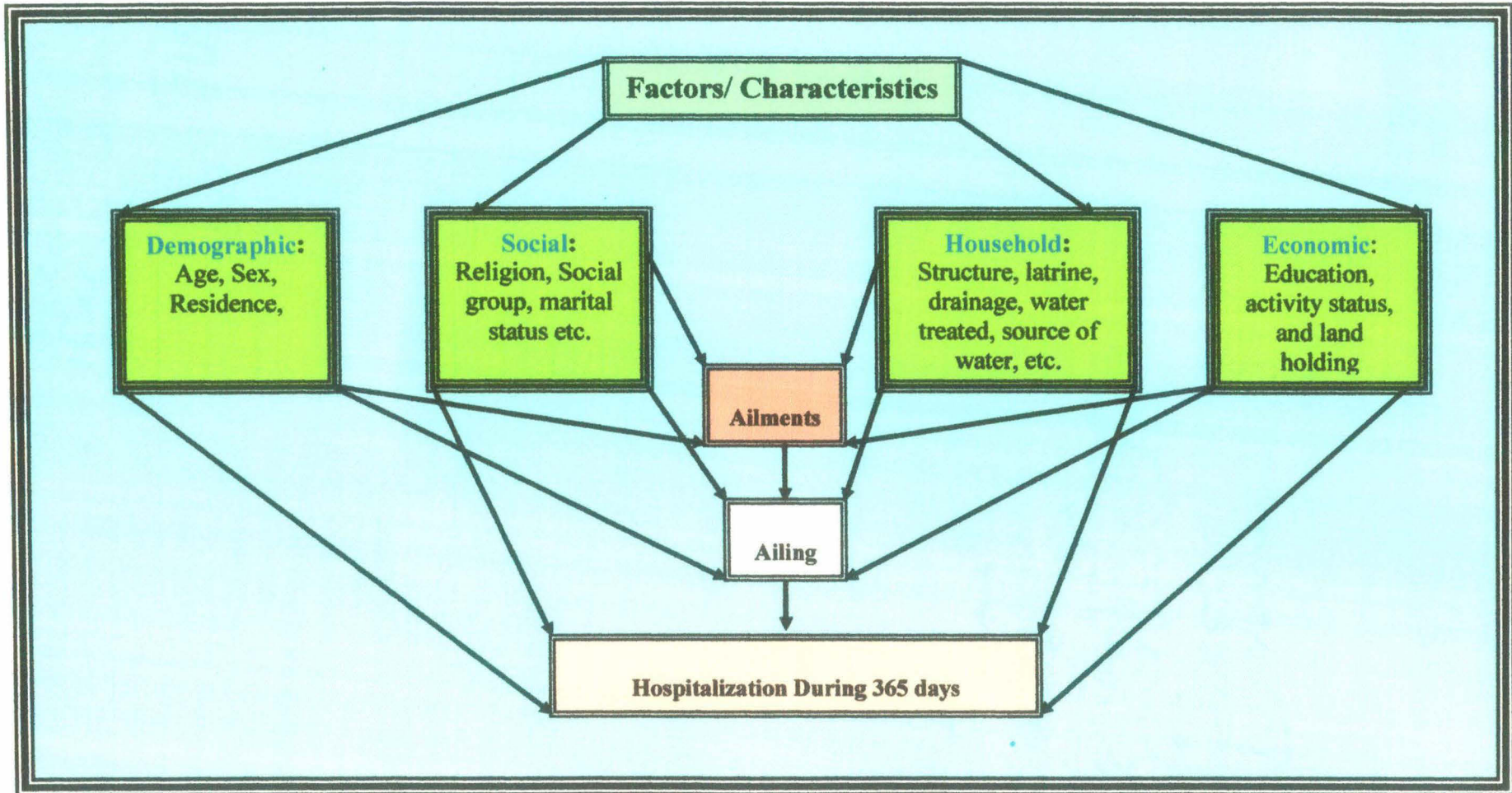


Figure 3.3: A Conceptual Framework for Ailing and Hospitalization in India

The source of the drinking water is directly related to the diarrhoeal disease (Chakrabarti, 2007). We have selected variables because of all these variables influence hospitalization.

The figure 3.3 shows the relationship between factors affecting diseases and hospitalization. The prevalence of disease and hospitalization, across all age group in rural- urban areas high (Anand et al, 2007), under 15 years 28 per cent hospital admission due to respiratory disease (Susser et al, 1985). The rural illiterate population was more suffer from the tuberculosis than literate (Kaulagekar and Radkar, 2007) and RTIs/STIs are negatively related with education (Sharma and Gupta, 2007). The incidence of the diabetes mellitus is high in the urban population in India (Balasubramanian et al, 2007). The Schedule Tribes children 5-9 years age were high tuberculosis infection in Andhra Pradesh (Chadha et al, 2007). The poor people are more vulnerable to tuberculosis because of living and working condition. We have taken household characteristic to examine whether type of structure, type of latrine, drainage facility, and source of drinking water and treatment of the water, energy for cooking are influencing hospitalization and how it related to demographic and social factors in terms of the disease pattern and hospitalization. In India most of the persons suffering from attacks of amoebiasis, giardiasis and other infective diarrhoeas that are attributable to socio economic and environmental conditions such as poor sanitation and contaminated drinking water. The accident and violence, and suicide were interpersonal and family problems and financial difficulties (Manoranjithan et al, 2007). To examine the effects of the indoor pollution created by source of energy for cook on health is the major issue for the household factors which influence ailing hospitalization. Most of the Indian population using its everyday household energy needs on inefficient and highly polluting solid fuels, particularly biomass, LPG and gobar gas. The consequence of this indoor air pollution is a chief cause of morbidity especially children and women (Sharma et al, 2004).

To analyze the effect of nature of ailments (diseases) in hospitalization cases, we have selected all the diseases in this framework. Most of the hospitalization cases were

due to prevalence of Chronic Obstructive Pulmonary Disease, heart failure, diabetes mellitus and acute respiratory infection and pneumonia.

3.2. Hypotheses:

The hypotheses have been developed on the basis of literature reviews and figure 3.3 as follows:

- 1- The demographic factors like age, sex, and residence status influence the disease pattern and hospitalization. For example Ghosh (2005) showed that prevalence of Acute Respiratory Infection (ARI) and Malaria is higher in rural residence than urban. Male child were suffer more than female children. Thus our hypothesis is that demographic factors influence ailing and hospitalization.
- 2- Differential disease pattern and hospitalization were found by religion and marital status. The prevalence of infectious diseases was higher among non Hindu persons (Ghosh, 2005). According to Swain et al., (2004) jaundice was not significantly different from currently married and prevalence of asthma was higher among widows. Thus, our hypothesis is that social factor, influence ailing and hospitalization.
- 3- Some of the studies show that type of structure, type of latrine, drainage facilities, source of drinking water, water treatment, and energy for fuel is the major cause of diseases and hospitalization. Sharma et al (2002) show that poor people and STs in rural residence are more vulnerable to tuberculosis because of living and working conditions. The indoor air pollution is a chief cause of morbidity among children and women. Therefore, we hypothesize that household factors are influencing the diseases and hospitalization.
- 4- The literacy, activity status and landholding affect ailing and hospitalization. In chapter 2 we show that those who illiterate and those in labour forces have higher

incidence of hospitalization. The ILO (2005) reported the highest incidence rate of injury; conjunctivitis and burn were among the labour force. The labour engaged in bleaching, calendaring, dying and sizing and power loom suffered from fever, cough and eye sore (Ambavalan and Madheswarn, 2001). Studies also show that those who have large landholding the rate of incidence of health problem than small and medium farmers. Therefore, we have developed a hypothesis, regarding economic factors, influence ailing and hospitalization of persons.

- 5- The ailing and hospitalization pattern is not uniform in all the ecological zones. For example India has different climatic conditions; each and every zone shows different pattern of diseases and hospitalization. According to Swain et al., (2004) the prevalence of asthma was high among widows in all the states, but T.B. was highest in Bihar and lowest in Himanchal Pradesh, whereas malaria and jaundice was highest in the Northeast region. Thus, another hypothesis is that regions of India show different disease pattern and hospitalization.

3.3. Methodology

The research methodology employed in conducting present study is discussed under the following sub-headings:

3.3.1. Data Source

The two rounds of National Sample Survey Organization (NSSO) survey data useful for the present study. We have used two rounds survey of the NSSO data i.e., 52nd and 60th round conducted in the year 1995-96 and 2004-05 respectively.

The NSSO provides information on various aspects which are of importance to the country. The NSSO was set up by the Government of India in 1950 to collect socio-economic data employing scientific sampling methods. The NSSO covers different

subjects such as employment and unemployment, consumer expenditure, land holdings, livestock enterprises, debt and investment, social consumption, morbidity and disability, etc., through household surveys. The NSS is a continuous survey in the sense that it is carried out in the form of successive “rounds” each round usually of one-year duration covering several topics of current interest in a specific survey period. The survey programme conforms to a cycle over a period of ten years and some being repeated once in five years.

The NSSO surveys on morbidity, health expenditure, health care services utilization and nutrition are useful sources of data related to health. Morbidity has been covered in nine rounds. In the 1950s there were four surveys on morbidity, two in the 1960s, one in 1970s and two surveys in 1980s which covered morbidity.

The NSSO 52nd survey is based on the enquiry on morbidity and health care conducted during July 1995 - June 1996. This survey is related to curative aspects of the general health care system in India and also the mother and child health (MCH) care programmes. The survey also presents utilization of the curative health care system and a morbidity profile of the population and hospitalized treatment of ailments. The four main topics covered in the 52nd round are: *utilization of maternity and child health care services; morbidity and utilization of medical services; problems of aged persons; and participation in education.*

The survey of the NSSO 60th round conducted in 2004, related to “*Household Consumers’ Expenditure*”, “*Employment and Unemployment*” and “*Morbidity and Health Care*”. Information related to morbidity, problems of aged persons, utilization of health care services and expenditure on medical treatment, hospitalization, health schemes, nature of ailment, duration of hospitalization and medical services was collected in the survey.

Thus, in the present study we have used NSSO 52nd round data on “*Morbidity and Treatment of Ailments*” and 60th round data on “*Morbidity and Health Care*”. These data provide an opportunity to examine the ailing and hospitalization in India.

3.3.2. Preparation of the data for analysis

The soft copy of NSSO 52nd and 60th round data has been imported into SPSS (Statistical Programme for Social Sciences) for statistical analysis. The data were collected using schedule number 25.0 during both surveys. In this schedule contains many Blocks. In 52nd round, block-1&2 provides household factors information whereas in 60th round block-3 for the same. Demographic particulars of household members is given in block-3 and block-4 in 52nd and 60th round respectively. The particulars of medical treatment received as inpatient of a hospital 365 days before survey is in block-4 and block-7 in 52nd and 60th round respectively. A continuous period of sickness owing to a specific ailment will be treated as a spell of ailment. The particulars of spells of ailments of household members 15 days before the survey is given in the block-5 in 52nd round and block-9 in 60th round. These blocks have been merged for the purpose of the study. Thus, we have developed two sets of the data of NSSO 52nd and 60th round data for the comparative study.

In the present study we have selected, ailments for which the patients were hospitalized during the last 365 days preceding the date of survey. Particulars of these ailments and their treatment as inpatients in hospitals during the reference period were collected in block 4 and 7 of the questionnaire in 52nd and 60th round survey respectively. Ailments are also measured as ailments for which the patients were treated during the last 15 days preceding the date of survey, whether or not hospitalized during the last 365 days. Particulars of these treatments were collected in block 5 and 9, separately for each spell in both the survey respectively. A hospitalized ailment (during 365 days) which is an ailment of the category, fall in the second category, if any treatment is received during the last 15 days for a spell of ailment for which the patient was hospitalized during the last 365 days. All the ailments suffered during the last 15 days preceding the date of

survey for which no medical treatment was as ailing fall in the third category of ailment. The particulars of such ailments and reasons for not taking treatment will be recorded in block 9 of the questionnaire. We have applied weighted data for analyses.

3.3.3. Statistical Tools

We have used SPSS for the statistical analyses of data.

3.3.4. Presentation of the data

The data have been analyzed in terms of percentage, Chi-square test, correlation and odds ratio of binary logistic regression.

3.3.5. Measurement of the Study Variables

Systematic and manageable categorization of variables is important for statistical analyses of ailing and hospitalization. Each category of a variable is assigned a unique code; but the codes do not bear any numerical values. The response and predictor variables are explained in the following section.

3.3.5.1. Response Variables

We would like to define some of the concepts such as hospitalization, ailing and ailments. In the hospital both public and private hospitals covered. In The NSSO 52nd and 60th round data hospitalization is defined as “a person who availed of medical services as an indoor patient in any hospital”. Hospital for the purpose of survey refers to any medical institution having provision for admission of sick persons as indoor patients (inpatients) for treatment. In the survey also noted that hospitalization in the cases of normal pregnancy and childbirth will not be treated as hospitalization cases (NSSO, 1998 and NSSO, 2006).

Ailment, i.e. illness or injury, means any deviation from the state of physical and mental well being. An ailment may not cause any hospitalization, confinement to bed or restricted activity. An ailing member is a normal member of the household who was

suffering from any ailment during the reference period. The sickness is defined as “one feel sick was treated as sick. This includes among other things: cases of visual, hearing, speech, locomotor and mental disabilities; injuries will cover all types of damages, such as cuts, wounds, haemorrhage, fractures and burns caused by an accident, including bites to any part of the body; and Cases of abortion - natural or accidental. These have not been included: cases of sterilization, insertion of IUD, getting MTP etc., cases of pregnancy and childbirth. In the surveys the respondent was asked about for each member of the household, whether he/she suffered from any ailment anytime during last 15 days and on the day of survey. Some ailments may be treated (either as an inpatient of a hospital or otherwise) and some untreated and both the cases were considered as ailment. A person under medication for an ailment during the reference period, whether felt sick or not is treated as ailing; cases of complications arising during pregnancy or after childbirth will be considered as ailment; and untreated injuries like cuts, burns, scald, bruise etc. of minor nature are not considered as ailing, if not severe. However, hospitalization of female members for child birth was not considered to be hospitalized for the survey.

We used three response variables (dependent variables). They are follows:

- Ailing one day before the survey

No = 0

Yes = 1

- Ailing 15 days before the survey

No = 0

Yes = 1

- Hospitalization 365 days before the survey

No = 0

Yes = 1

3.3.5.2. Predictor Variables

The following predictor variables (independent variables) are considered in the study:

1. Demographic Factors

Age

The categories of the age group in report of NSSO 60th round are 0-14, 15-29, 30-44, 45-59 and 60 and above.

0-14 = 0

15-29 = 1

30-44 = 2

45-59 = 3

60+ = 4

Sex

We have selected sex as a particular variable as ailing and hospitalization depends on sex of the individual.

Male = 0

Female = 1

Residence

Rural = 0

Urban = 1

2. Social Factors

Religion

India has many religious groups, and their different food habits, living style and living condition influencing disease. It is interesting to study the disease pattern among the different religious groups. So, we have included all the religion in the study. Religions mention in the NSSO report are Hinduism, Islam, Christianity, Sikhism, Jainism, Buddhism, Zoroastrianism and others. In 52nd round survey the information of religion is not available. Because some religions are very low in percentages, for the analysis we classified religions into three groups:

Hindu = 0

Muslim = 1

Others = 2

Social Group

Others = 0

ST = 1

SC = 2

OBC = 3

In 52nd round survey the category of social group were ST, SC, and others castes.

Marital Status

Marriage is the important social institution. It is important to study the variation of the ailing and hospitalization within marital status. In the survey the respondents have been asked about marital status- never married, currently married, widowed and divorced/separated. For the purpose of analysis widowed and divorced/separated are clubbed into one category.

Never married = 0

Currently married = 1

Widowed/ divorced/separated = 2

3. Household Factors

Type of Structure

Living places is also correlated to disease pattern. In the survey type of structure has five categories: pucca, semi-pucca, serviceable kutcha, unserviceable kutcha and no structure. For the analysis we have classified them into two categories- pucca (including semi-pucca), kutcha (serviceable, unserviceable, and other structure). According to NSSO, a pucca structure is one whose walls and roofs (at least) are made of pucca materials such as cement, concrete, oven burnt bricks, stone, stone blocks, cement plastered reeds, iron and other metal sheets, timber, tiles, slate, corrugated iron, asbestos cement sheet, etc. A kutcha structure which has walls and roof made of non pucca materials is regarded as a kutcha structure, non-pucca materials include unburnt bricks, bamboo, mud, grass, leaves, reeds and/or other thatch.

Pucca = 0

Kutcha = 1

Source of Drinking Water and its Treatment

There are many diseases, which are related to source of drinking water like diarrhoea. So, it is important to know the relationship between source of drinking water and ailing. In the survey major sources of drinking water are bottled water, tap, tube-well/ hand pump, tankers, pucca well, tank/ pond reserved for drinking, river/ canal and others. We have grouped all the source of drinking water in the study into three categories:-

Bottled and tap water = 0

Tube well/hand pump = 1

Other sources = 2

Water Treated

It is to be ascertained whether any treatment of water is done before drinking. Some involve the precipitation of soluble impurities and others, the separating out of insoluble impurities through various kinds of “filters” including cloth screens. Bacteria in the water are killed by boiling the water or by ultraviolet rays in the “Aquaguard”-type water treatment appliances. All these cases are to be considered as “treatment” of water. This information is not available in 52nd round survey.

In the surveys the respondents were asked whether water is treated before drinking.

No = 0

Yes = 1

Type of Latrine

Availability of latrine in the residence is also a good indicator of the development. And it is related to health condition of the residence. We would like to study the relationship between type of latrine and ailing and hospitalization among household members. There are two types of conditions- latrine and no latrine. Within latrine four types of the latrine are reported i.e. service, pit, septic tank/flush system and others. We have categorized these into two groups:

No latrine = 0

Latrine = 1

Type of Drainage

Proper drainage in household is correlated to health condition of the residents. Therefore, we have taken type of drainage for the study. In the report type of drainage are open kutchra, open pucca, covered pucca, under-ground and no drainage. We have classified into three categories- open (kutchra and pucca), covered (pucca and under ground) and no drainage.

No drainage = 0

Open drainage = 1

Covered = 2

Source of Energy for Cooking

A relationship between source of energy for cooking and ailing and hospitalization among the household members has been reported in the literature. The sources of energy for cooking are coke, coal, firewood and chips, LPG, gobar gas, dung cake, charcoal, kerosene, electricity, others and no cooking arrangement. For the purpose of the study we have grouped these into three categories i.e. coke, coal, firewood and chips are in the first group and second group is LPG and gobar gas and last one is other sources. This information is not available in the 52nd round survey.

Firewood and chips = 0

LPG = 1

Others = 2

4. Economic Factors

Education Level

Education is highly correlated to ailing and hospitalization cases. In the survey general education level is mentioned in 11 categories i.e. not literate, literate-without formal schooling, below primary, primary, middle, secondary, higher secondary, diploma/ certificate course, graduate, post-graduate and above. A person who can read and write a simple message in any language with understanding is considered literate. Those who cannot do so was treated as not literate. For the study we have classified general education level into three categories i.e.

Illiterate = 0

Up to primary = 1

Middle to and above = 2

Usual Activity Status

Activity status in NSSO is the activity situation in which a person was engaged during reference period of 365 days before the survey. There are two statuses: labour force and not in labour force. Labour force includes self-employed (own account worker, employer, unpaid family worker), salaried, casual (in public works and other work), and seeking job. Attending educational institution, domestic duties, and collection of goods for domestic use, recipient of rent, pension, remittance, not able to work due to disability, beggars, prostitute and others falls under the not in labour force status. In this study we have been grouped labour force status as:

Not in labour force = 0

Labour force = 1

Land holding

Land holding is the most important status of an individual in rural areas. Minimum land holding in the survey reported is less than 0.005 hectare and the maximum is 8.00 hectares. For the analysis we have grouped land holding into three categories:

0.005- 0.010 Ha = 0

0.020- 1.00 Ha= 1

1.00 and above Ha = 2

This information is not available in the 52nd round survey.

5. Region

In India, there are 29 states and 6 Union Territories (UTs). These states and UTs are clubbed into six regions. The North region includes Jammu and Kashmir, Himanchal Pradesh, Punjab, Haryana, Delhi, Rajsthan and Chandigarh. In the Central region Uttar

Pradesh, Uttaranchal, Madhya Pradesh, Chhatisgarh are included. Bihar, Jharkhand, Orissa, and West Bengal form the eastern region while Arunchal Pradesh, Assam Manipur, Meghalaya, Mizorum, Nagaland, Sikkim and Tripura are in the northeastern region. The Western region contains Goa, Gujrat, Maharastra, Daman and Diu and Dadra and Nagar Haveli. Andhra Pradesh, Karnataka, Kerala, Tamilnadu, Lakshadweep, Pondicherry and Andman & Nicobar Island in the Southern region.

North = 0

Central = 1

East = 2

Northeast = 3

West = 4

South = 5

The newly constructed states, in 2001 (Uttaranchal, Jharkhand, and Chattisgarh) which were not available in 52nd round survey.

6. Nature of Ailments

According to NSSO survey's concepts and definitions, ailment i.e. illness or injury, means any deviation from the state of physical and mental well being. In other words, one will be treated as sick if one feels sick. This was included cases of visual, hearing, speech, and locomotor disabilities. Injuries covers all types of damages, such as cuts, wounds, haemorrhage, fractures and burns caused by an accident, including bites to any part of the body. An ailment may not cause any necessity of hospitalization, confinement to bed or restricted activity. An ailing member is a normal member of the household who was suffering from any ailment during the reference period. Cases of sterilization, insertion of IUD, getting MTP etc., pregnancy and child birth will not be treated as cases of ailment. But abortion, natural or accidental, will be treated as ailment. A case of ailment will generally be identified with a specific cause and attempt has to be

made to treat ailment from two different causes as two cases of ailment even when the person is the same.

A total of 38 and 42 ailments are listed in the 52nd and 60th round survey respectively. For the purpose of the survey, some of the ailments have been grouped into categories. For example, heart diseases and hypertension have been grouped as cardiovascular diseases. However, some ailments such as, diseases of skin, goiter, diabetes mellitus, under nutrition, anaemia, and sexually transmitted diseases (STDs) have been only listed. Since some ailments have not been grouped and others have not been grouped into manageable categories, the 42 ailments have been classified so that a meaningful analysis can be conducted.

In order to group the ailments we have used the latest classification of disease by World Health Organization (WHO, 2007). We have used the International Classification of Diseases (ICD), 10th version, to group the ailments and the WHO category and the ailments included in the category are as follows:

Ailments in NSSO 52nd round:

- I. Infectious and Parasitic Diseases:** Diarrhea/Dysentery, Warm Infection, Amoebiasis, Hepatitis/Jaundice, Skin Disease, Malaria, Mumps, Eruptive, Diphtheria, Tetanus, Filariasis /Elephantiasis, Whooping Cough, Chicken pox, Measles, Leposy.
- II. Neoplasms:** Cancer and other Tumors.
- III. Endocrine, Nutritional and Metabolic:** Goiter, Diabetes, Under Nutrition, beri beri, Rickets, and Anaemia.
- IV. Neuro-Psychiatric disorders:** Gynaecological disorder and Psychiatric disorder, Epilepsy, other diseases of nerves,
- V. Diseases of Eye:** Conjunctivitis, Glaucoma and Cataract.
- VI. Circulatory System Diseases:** Heart Diseases, high/low blood pressure, cerebral stroke and Hypertension.
- VII. Respiratory System Diseases:** Tuberculosis, Bronchial Asthma and other diseases

of the ear.

VIII. Digestive System Diseases: Gastritis/Gastric or Peptic/Duodenal Ulcer.

IX. Genitourinary System Disease: Sexually Transmitted Diseases, Diseases of Kidney/Urinary System, Prostatic Disorder, Hydrocele, Piles.

X. Accidents and Violence: Injury due to accident and violence.

XI. Others: Pain in joints, Locomotor disability, Blinds, Speech, Hearing and fever, Diseases of Mouth/Teeth/Gum, other congenital deformities, other Diagnosed ailments and other Undiagnosed ailments.

Ailments in NSSO 60th round:

I. Infectious and Parasitic Diseases: Diarrhea/Dysentery, Warm Infection, Amoebiasis, Hepatitis/Jaundice, Skin Disease, Malaria, Mumps, Eruptive, Diphtheria, Tetanus, Filariasis /Elephantiasis, Whooping Cough.

II. Neoplasms: Cancer and other Tumors.

III. Endocrine, Nutritional and Metabolic: Goiter, Diabetes Mellitus, Under Nutrition, and Anaemia.

IV. Neuro-Psychiatric disorders: Gynaecological disorder and Psychiatric disorder.

V. Diseases of eye: Conjunctivitis, Glaucoma and Cataract.

VI. Circulatory System Diseases: Heart Diseases and Hypertension.

VII. Respiratory System Diseases: Tuberculosis, Bronchial Asthma and Ear/ Nose/ Throat Ailment.

VIII. Digestive System Diseases: Gastritis/Gastric or Peptic Ulcer.

IX. Genitourinary System Disease: Diseases of Kidney/Urinary System, Prostatic Disorder.

X. Accidents and Violence: Accident/Injuries/Burns/Fractures and Poisoning.

XI. Others: Locomotor's, Blinds, Speech, Hearing and Diseases of Mouth/Teeth/Gum, other Diagnosed ailments and other Undiagnosed ailments.

A compare of the ailments 52nd round and 60th round shows that there is considerable similarity. However, incase of a few ailments they either are listed in 52nd

round and vice-versa. For example leprosy is separate in 52nd round, but in 60th round included in skin diseases. We have included such ailments in the appropriate ICD category. These minor changes will not affect that are presented in the next chapter.

3.3.6. Statistical Techniques

The hypotheses that have been developed following the various objectives will be empirically tested by using statistical techniques. The study mainly uses the following quantitative research methods i.e. Univariate, Bivariate, Correlation and Multivariate analysis.

The **Univariate** has been carried out in order to study the percentage distribution of ailing and the hospitalized person. This analysis provides the descriptive statistics on the Demographic, Social, Household, Economic, Health factors and Indian region.

Bivariate has been observed between the factor of Ailing and Hospitalization, and all Factors. It examined with the help of cross tabulation table. A cross tabulation is that, where each row or column is a frequency table of one variable for observation following within a specific category of the other variable. Cross-tabulation shows the comparison between groups and gross effects of the variables.

Chi-square test has been used to draw conclusions about the population from the sample data, by checking the correspondence between the observed and estimated frequencies in each category of the nominal variable. According to Mahmood (1998) the main assumption behind the chi-square test is that the variables are independent of each. As a result with increasing strength of the association between the two variables, the statistics chi-square will be statistically significant at a lowest.

Chi-square

$$= (O_i - E_i)^2 / E_i$$

Where O_i and E_i are observed and expected frequency of the i th class respectively.

Correlation Coefficients

In this study independent variables are categorical and nominal in nature. In this case of such independent variables, we have re-categorized into dichotomous variables, with assumption that the dichotomy will fairly represent an interval scaled variable. The correlation indicates the strength and direction of a linear relationship between two random variables or it refers to the departure of two variables from independence. We have calculated Pearson correlation; it reflects the degree of linear relationship between two variables. For analysis of the correlation, we have recoded the entire nominal variable into continuous variable. Some of the variables are already in continuous in nature such as residence (rural and urban), sex (male and female), water treated (yes and no), ailing (yes and no), and hospitalized (yes and no). Remaining variable are categorized as religion (Hindu and Non-Hindu), structure (pucca and Kutchha), latrine facility (latrine and no latrine), activity status (labour force and not in labour force), marital status (married and never married), age group (< 30 year and > 30 year), social group (STs/SCs and Other), educational level (literate and illiterate), drainage facilities (drainage and no drainage), and land holding (< 1.0 hectare and > 1.0 hectare).

Multivariate Logistic Regression

Multivariate Logistic Regression analysis has been used in order to measure the net effect of predicted variables on the response variables.

Multivariate logistic regression analysis has been used in order to measure the net effect of back ground variable on the response variables. The response variable are dichotomous in nature i.e. No = 2 and Yes =1 (Recoded 'No=0' and 'Yes=1').

The response variables in this study are dichotomous in nature, taking 1 or 0 as value. Most commonly used approaches to estimate these types of models are:

- (a) The Linear Probability Model (LPM)
- (b) The Probit model
- (c) The Logit model or logistic regression model (Gujrati, 1995)

First we have discussed the reasons for not using LPM or Probit model in this analysis; and next the logistic regression model will be explained.

LPM is a special form of ordinary multiple regression model to be used in the occasion where the response variable is a dichotomous. The equation has the form

$$\hat{C} = a + b E \quad (1)$$

Where \hat{C} is the value of C as predicted by the regression. E is interpreted as the probability (P) that with a specific value of E, the value of C will be 1.

- (a) The estimated probability P can assume impossible values: from negative or more than unity.
- (b) The linearity assumption is violated seriously. According to this assumption the expected value of C at any given value of 'e' falls on the regression line. But this is not possible for the parts of the line for which $P < 0$ or $P > 1$. In these regions, the observed points are either all above the line or all below the line.
- (c) The homoscedasticity assumption is seriously violated. The variances of the C values tend not to behave properly either. The variance of the C tends to be much higher in the middle range of E than at the two extremes, where the values of C are either mostly Zeroes or monthly ones. In this situation, the equal variance assumption is untenable.

- (d) Because the linearity and homoscedasticity assumptions are seriously violated, the usual procedures for hypothesis testing are invalid.
- (e) R² tends to be very low. The fit of the line tends to be very poor. Because the response variable can assume only two values, 0 and 1, the C values tend not to cluster closely about the regression line (Retherford and Choe, 1993).

So, we need such a probability model, where the P increases as the value of predictor increases but the value of P never goes beyond the 0-1 interval and also the relationship between P and the predictor variable is non linear. Probit and logit models fulfill these two criteria. Both model use sigmoid curve in a logistic model level of before reaching P=0 or P=1. Thus the impossible values of P (P<0 or P>1) that are observed in the probit model are avoided. For these reason binary logistic model has been selected in our study for the multivariate analysis.

The basis for of logistic regression is:

$$P = \frac{1}{1 + e^{-z}} \quad (1)$$

Where P= Estimated Probability

Z= the predictor variable and

e= base of natural logarithm with a value of 2.7183.

As can be seen from the logistic curve predictor variable has the largest effect on P, when P=0.52. Value of P decreases in absolute magnitude as P approaches 0 or 1 after simplifying equation (1). We get,

$$\text{Log } z = \frac{P}{1 - P} \quad (2)$$

The quantity $(P / 1-P)$ is called odds, and the quantity $\log (P / 1-P)$ is called the log odds or logit of P, so, equation (2) becomes,

$$\text{Logit } P = Z \quad (3)$$

The multivariate logistic functions involving 'n' predictor variables is represented by

$$P = \frac{1}{1 + e^{-(b_0 + b_1.x_1 + b_2.x_2 + \dots + b_n.x_n)}} \quad (4)$$

$$\text{Or Logit } P = b_0 + b_1.x_1 + b_2.x_2 + \dots + b_n.x_n \quad (5)$$

The coefficient b_1 represents the additive effect of one unit change in predictor variable x_1 on the logs odds of the response variable. Whereas one unit increases in x_1 , holding other predictor variables constant, multiplies the odds by the factor e^{b_1} . For this reason the quantity e^{b_1} is called the odds ratio i.e. ratio between the old value and the new value of the odds. In any logistic regression odds ratio are interpreted and not 'b' because e^{b_1} is more readily understandable. e^{b_1} (exp. B) has been interpreted in our data analysis to show the effect of one unit change in the predictor variables on the odds of the response variables showing the ailing and hospitalization.

3.4. Area of the study

India has diverse climatic conditions and there are different natures of diseases in its various locations or climatic conditions. The pattern of ailing and hospitalization cases may or may not be same in all the location of the country. It is important that we should know the various factors influencing the ailing and hospitalization in the respective regions in India. And no any study carried out at all India level so far. Therefore, all the States and Union Territories have included for the study. These States and Union

Territories have been grouped into six regions i.e. North, Central, East, Northeast, West and South.

3.5. Limitation of the Study

A major limitation of the NSS data on morbidity is the changing extent of coverage and methodology. The study depends on the secondary source of data, so information on some other desired variables were not available. Also some of the variables were not available in the both surveys. For example in 52nd round survey, the information regarding religions, treatment of water, landholdings was not available, but in 60th round survey we have data on these variables.

The next chapter provides detailed statistical analyses of the data to understand the influences of various factors on ailing and hospitalization in India.

Chapter 4

Results and Discussion

Chapter 4

Results and Discussion

Statistical analyses have been carried out in order to study the factors influences ailing and hospitalization in both the survey i.e., 52nd and 60th round. In the analyses that follow, we first present the description of the variables used in the study. Second the bivariate relationship between the response and predictor variables has been examined. The response variables are ailing one day before the survey; ailing 15 days before the survey; and hospitalization during 365 before the survey and predictor variables are Demographic (age, sex and residence), Social (religion, social group and marital status), Household (types of structure, sources of drinking water, water treated, types of latrine, drainage facility, sources of energy for cooking) and Economic (education, activity status and land holding) and region (north, central, east, northeast, west and south). A correlation analyses has been carried out for the linear relationship between the continuous variables. Finally multivariate logistic regression analyses have been done to understand the net effect of the predictors' variables on response variables, by controlling for other predictor variables.

4.1. Description of the Data

Description of the ailing and hospitalization cases in India, have been presented in tables 4.1 to 4.3. This presentation is followed by the response variables which were discussed in chapter 3. The data have been presented as i.e. (A) Demographic, (B) Social, (C) Household, (D) Economic, (E) Health factors, and (F) Region.

4.1.1. Percentage Distribution of Persons Ailing One Day Before the Survey

A-Demographic Factors

Under demographic factors we have included age group, sex, and residence. The table 4.1 indicates that in 52nd round, ailing one day before the survey was high in 0-14 years (24.4 per cent) and 60+ years (22.4 per cent) age groups. And same patterns of

ailing followed in the 60th round survey. But the ailing among the middle ages decreased in the later survey. Ailing among males and females were more or less same in both survey. A higher per cent of rural residence were among the ailing in both rounds. Among ailing about three fourths (76.0 per cent and 70.0 per cent in respective surveys) are rural residence and nearly one fourths (24.0 per cent and 30.0 per cent) were urban residents in both surveys respectively.

B. Social Factors

Information about the religion was not collected, in the 52nd round. The results show that in the 60th round as expected highest share of ailing person were Hindu followed by Muslims. The share of Hindu was about 79.0 per cent and 14.0 per cent were Muslims. The share of STs and SCs was lowest among the ailing persons in the both surveys. The share of currently married couples was higher among the ailing in both rounds.

C. Household Factors

An important reason for occurrence of diseases, especially those that are exogenous in nature, is the household factors. Members of the households that are endowed with better water and sanitation facilities generally tend to have lower incidence of diseases that are related to them. For example, occurrence of diarrhea among household members is directly linked with the use of clean water and hygiene. It is interesting to note that in 52nd round survey about three fourth of the ailing persons were living in kutchra house but later survey shows that around 65.0 per cent of them living in pucca house structure. It is possible because of the gap of ten years. Water is elixir of life, and it affects health directly. Contaminated water is the main source of diarrhoea and other diseases.

Table 4.1: Percentage Distribution of Persons by Ailing One Day Before the Survey

S.No.	Factor	52 nd round	60 th round
A.	Demographic		
1	Age Group		
	0-14	24.4	19.4
	15-29	16.1	12.0
	30-44	18.5	17.7
	45-59	18.6	19.6
	60+	22.4	31.3
2	Sex		
	Male	49.6	47.4
	Female	50.4	52.6
3	Residence		
	Rural	75.9	70.3
	Urban	24.1	29.7
B.	Social		
1	Religion		
	Hindu	NA	78.7
	Muslim	NA	13.7
	Others	NA	7.6
2	Social Group		
	STs	1.3	4.1
	SCs	5.9	18.9
	OBCs	--	38.2
	Others	92.8	38.8
3	Marital Status		
	Never married	32.1	26.4
	Currently married	54.2	56.5
	Widow/ Divorced and Separated	13.7	17.1
C.	Household		
1	Type of structure		
	Pucca	27.3	64.4
	Kutchha	72.7	35.6
2	Source of Drinking Water		
	Bottled and tap water	12.0	39.5
	Tube well and Hand pump	11.1	43.1
	Others	76.9	17.4
3	Water Treated		
	Yes	NA	30.0
	No	NA	70.0
4	Type of Drainage		
	Open	56.3	36.2
	Covered	32.6	18.8
	No drainage	11.0	45.0

5	Latrine		
	Latrine	67.6	47.4
	No latrine	32.4	52.6
6	Source of Energy for Cooking		
	Firewood and chips	NA	56.5
	LPG	NA	26.7
	Others	NA	16.8
D.	Economic		
1	Education		
	Illiterate	56.6	49.9
	Upto Primary	24.6	25.2
	Middle and above	18.8	24.9
2	Activity Status		
	Labour force	34.8	32.1
	Not in Labour	65.2	67.9
3	Land Holding		
	.005-.010 HA	NA	42.3
	.020-1.000 HA	NA	40.8
	1.000+	NA	16.9
E.	Health		
1	Disease		
I	Infectious and Parasitic	8.6	16.1
II	Neoplasms	3.6	3.0
III	Endocrine, Nutritional and Metabolic	4.0	5.0
IV	Neuro-Psychiatric	4.0	6.4
V	Eye	5.9	4.9
Vi	Circulatory	11.7	12.9
VII	Respiratory	8.5	13.6
VIII	Digestive	3.4	4.0
IX	Genito-Urinary	7.0	8.7
X	Accidents and Violence	2.0	8.6
XI	Others	41.3	16.8
F	Region		
	North	12.1	10.9
	Central	24.5	24.5
	East	19.0	17.4
	Northeast	2.7	2.0
	West	13.2	15.8
	South	28.5	29.4
	Total	24191440	10915338145

Source: NSSO, 1998 and NSSO, 2006

NA-not available

The sources of drinking water we have selected are bottled and tap water, tube well/hand pump and others (tankers, pucca well, tank/pond reserved for drinking and river/canal). Households who have used bottled and tap water, and tube well and hand pump as source of drinking water show less ailment whereas in 60th round these were high. And the persons who have used treated water for drinking were less ailing than those not treated before drink. This information was not collected in earlier round of the survey. Better drainage facilities are the indicator of the social development for the particular area. It is also an indicator of sanitation and control of specific diseases especially malaria and diarrhoea. A high per cent of the persons were ailing where open drainage system was available, than covered and no drainage in 52nd survey, but later survey shows just reverse results i.e., the household who do not have any drainage facilities there was more ailment. According the 52nd round survey members of household were more ailing those having latrine facilities in the house compared with no latrine, but in contrast to this later survey showed ailing was higher for those having no latrine facilities in the house. In India, majority of the rural residents using the firewood and chips as sources of energy for cooking. These fuels produce a lot of smoke and as a consequence of that polluting air creates indoor air pollution, which affects the health of the residents. Information about source of energy for cooking was not collected in the 52nd survey. The analyses showed member of household were more ailing have used firewood and chips as source of energy for cooking followed by LPG.

D. Economic Factors

Under economic factors we have included education, activity status and land holding. The earlier survey did not collect information on land holding. Education level is important indicator of the human resource development. Education influences health, because the level of education determines the individual's awareness regarding health, personal hygiene, sanitation and prevention and cure of diseases. Female literacy is important since the females play a pivotal role in influencing. The household health to the great extent is maintained by cleanliness in the household and surroundings, adopting hygienic cooking and storage practices and educating the children about health. In both

surveys the results show that illiterate were more ailing than literate, but later survey shows decrease in ailing one before the survey by six per cent among illiterates whereas increase among the higher education level. Large land holding is a status of economic condition in rural India. Among the activity status the member of household who were not in labour force were ailing more in both the surveys. In India majority of the landholders are small and marginal land holders. The study shows a majority of them who were ailing, fall under this category.

E. Health Factors

We have included nature of ailments (Diseases) which discussed in chapter 3. It found that high percentage (41.3) members of household ailing one day before the survey was due to others diseases followed by circulatory (11.7), infectious and parasitic (8.6) and respiratory diseases (8.5 per cent) in the 52nd round survey. In the 60th round survey highest ailment was due to infectious and parasitic, circulatory and respiratory diseases, 16.0, 13.0, and 13.6 per cent respectively.

F. Region

Both the surveys covered all Indian states and Union Territories (UTs). These states are clubbed into six regions i.e. North, Central, East, Northeast, West and South region. In both the survey we have found that among ailing population in India the highest percentage of them belong to the South and Central part of the India followed by East and West. Lowest ailing was reported in the Northeast region.

4.1.2. Percentage Distribution of Persons by Ailing 15 Days Before the Survey

We have further analyzed ailing 15 days before the survey by different factors as follows:-

A-Demographic Factors

The analyses shown in table 4.2 among the members of household who were ailing 15 days before the survey the highest per cent of them were 0-14 year age group in both surveys. The 60th round survey showed older persons (60+) more ailing than earlier survey. Among males and females there is not many difference in both surveys, but females were slightly more ailing than males. Rural residents were more ailing than urban in both survey, but in 60th round survey ailing among urban persons slightly increased than earlier survey.

B- Social Factors

We find that a majority of the ailing persons were Hindu (79.7 per cent) after that Muslims are second majority among them in 60th round survey. In 52nd round this information not collected. Among social groups a vast majority of them were other caste people in both surveys. Here again we find that ailing 15 days before the survey, SCs increased around four times more ailing in later survey than earlier one. Similarly, STs were also showing the same picture in the table 4.2. The Caste OBCs were not categorized in the 52nd round survey. The currently married couples and never married persons represent more ailing 15 days before the survey in both the surveys. Never married persons were slightly decreased in 60th round.

Table 4.2: Percentage Distribution of Persons who were ailing 15 Days Before the Survey

S.No.	Factor	52 nd round	60 th round
A.	Demographic		
1	Age Group		
	0-14	32.4	28.2
	15-29	16.9	14.1
	30-44	18.1	17.1
	45-59	15.9	17.0
	60+	16.7	23.6
2	Sex		
	Male	49.6	48.1
	Female	50.4	51.9
3	Residence		
	Rural	76.1	72.2
	Urban	23.9	27.8
B.	Social		
1	Religion		
	Hindu	NA	79.7
	Muslim	NA	13.4
	Others	NA	6.9
2	Social Group		
	STs	1.6	5.2
	SCs	5.2	19.3
	OBCs	--	38.9
	Others	93.2	36.6
3	Marital Status		
	Never married	40.9	36.0
	Currently married	48.0	50.2
	Widow/ Divorced and Separated	11.1	13.8
C.	Household		
1	Type of structure		
	Pucca	26.3	61.7
	Kutchha	73.7	38.3
2	Source of Drinking Water		
	Bottled and tap water	9.7	37.5
	Tube well and Hand pump	9.9	45.2
	Others	80.4	17.3
3	Water Treated		
	Yes	NA	28.2
	No	NA	71.8
4	Type of Drainage		
	Open	55.9	36.2
	Covered	33.6	17.4

	No drainage	10.5	46.4
5	Latrine		
	Latrine	33.2	44.5
	No latrine	66.8	55.5
6	Source of Energy for Cooking		
	Firewood and chips	NA	58.6
	LPG	NA	24.2
	Others	NA	17.2
D.	Economic		
1	Education		
	Illiterate	55.5	50.4
	Upto Primary	26.0	26.0
	Middle and above	18.5	23.6
2	Activity Status		
	Labour force	32.5	31.2
	Not in Labour	67.5	68.8
3	Land Holding		
	.005-.010 HA	NA	41.7
	.020-1.000 HA	NA	41.3
	1.000+	NA	17.0
E.	Health		
1	Disease		
I	Infectious and Parasitic	9.8	18.5
II	Neoplasms	3.6	2.9
III	Endocrine, Nutritional and Metabolic	3.5	4.4
IV	Neuro-Psychiatric	3.7	5.9
V	Eye	5.0	4.6
Vi	Circulatory	11.7	11.7
VII	Respiratory	7.8	12.9
VIII	Digestive	3.0	4.4
IX	Genito-Urinary	7.2	9.0
X	Accidents and Violence	2.1	8.5
XI	Others	42.5	17.2
F	Region		
	North	11.3	10.3
	Central	25.5	25.3
	East	19.8	19.1
	Northeast	4.7	3.0
	West	12.4	15.2
	South	26.3	27.1
	Total	45262719	17470594153

Source: NSSO, 1998 and NSSO, 2006,

NA-not available

C. Household Factors

In 52nd round survey the members of household who lived in kutcha house were more ailing during 15 days before the survey whereas later survey shows just reverse picture. It is interesting to note that in 1998 fewer members of household used bottled and tap water (9.7 per cent), and tube well and hand pump (9.9 per cent) water for drinking, in contrast to that a majority (82.7 per cent) in 2006 were ailing. The persons who were more ailing were those who had drainage facility in the house in earlier survey and a reverse picture is shown in later survey. In both the surveys, members were more ailing has no latrine facility in the house as compared to having latrine in the house. The majority of the persons were ailing have used firewood and chips, and LPG as source of energy for cooking in house. This information was not available in the earlier survey.

D. Economic Factors

More than half the ailing persons were illiterate in both the surveys, it was high in the earlier survey and it decreased by five per cent in later survey. As in ailing one day before the survey a similar result was found for those persons who were ailing 15 days before the survey, in case not in labour force. The majority (83.0 per cent) of the ailing persons have less than one hectare landholding in the 60th round survey, and this information is not available for the earlier survey.

E. Health Factors

The highest percentage of members of household who were ailing due to other diseases (42.5 per cent) in the earlier survey, whereas in the later survey this is due to infectious and parasitic diseases (18.5 per cent). There were not any differences in ailing due to circulatory diseases that were reported in both the

surveys. The members who suffered from respiratory diseases were 7.8 per cent in the 52nd round survey, whereas it increased to about 13.0 per cent in the 60th round survey.

F. Region

As discussed earlier South Indian and Central region people were more ailing in one day before the survey in both surveys. Similar results found in ailing 15 days before the survey. About one fourths (26.3 and 27.1 per cent) in south and similarly (25.5 and 25.3 per cent) in central region people were ailing in both the surveys respectively.

4.1.3. Percentage Distribution of Persons by Hospitalized 365 days Before the Survey

A-Demographic Factors

So far, we have discussed about the ailing but it is not necessary for the persons to be hospitalized. We are discussing hospitalized 365 days before the survey. The figures in table 4.3 show there were not many differences in hospitalization among the age group in both surveys, but it is somewhat high among old age group in the 60th round survey than earlier survey. There were not many differences in hospitalization among the males and females, but males were more hospitalized than females in both the surveys. The share of rural residents was higher than urban residents among hospitalized members in both the surveys. About two thirds of the rural residents were hospitalized during 365 days before the survey in India.

Table 4.3: Percentage Distribution of Persons by Hospitalization 365 days before the survey

S.No.	Factor	52 nd round	60 th round
A.	Demographic		
1	Age Group		
	0-14	20.1	19.6
	15-29	22.7	21.3
	30-44	21.6	21.4
	45-59	20.4	20.1
	60+	15.2	17.7
2	Sex		
	Male	52.8	52.1
	Female	47.2	47.9
3	Residence		
	Rural	67.3	68.5
	Urban	32.7	31.5
B.	Social		
1	Religion		
	Hindu	NA	80.0
	Muslim	NA	11.9
	Others	NA	8.1
2	Social Group		
	STs	1.7	5.1
	SCs	5.6	18.5
	OBCs	--	41.3
	Others	92.7	35.0
3	Marital Status		
	Never married	29.9	29.5
	Currently married	61.1	60.2
	Widow/ Divorced and Separated	9.0	10.3
C.	Household		
1	Type of structure		
	Pucca	24.7	66.2
	Kutchra	75.3	33.8
2	Source of Drinking Water		
	Bottled and tap water	12.3	45.2
	Tube well and Hand pump	8.7	35.0
	Others	79.0	19.8
3	Water Treated		
	Yes	NA	35.6
	No	NA	64.4
4	Type of Drainage		
	Open	56.6	34.1
	Covered	32.3	19.1

	No drainage	11.1	46.8
5	Latrine		
	Latrine	57.9	49.6
	No latrine	42.1	50.4
6	Source of Energy for Cooking		
	Firewood and chips	NA	58.4
	LPG	NA	28.4
	Others	NA	13.2
D.	Economic		
1	Education		
	Illiterate	43.0	40.8
	Upto Primary	29.2	26.9
	Middle and above	27.8	32.3
2	Activity Status		
	Labour force	39.8	39.5
	Not in Labour	60.2	60.5
3	Land Holding		
	.005-.010 HA	NA	43.1
	.020-1.000 HA	NA	38.8
	1.000+	NA	18.1
E.	Health		
1	Disease		
I	Infectious and Parasitic	10.6	26.8
II	Neoplasms	1.7	2.2
III	Endocrine, Nutritional and Metabolic	2.5	2.7
IV	Neuro-Psychiatric	3.7	3.9
V	Eye	4.3	3.7
VI	Circulatory	9.2	7.0
VII	Respiratory	7.8	8.1
VIII	Digestive	3.5	4.6
IX	Genito-Urinary	7.0	10.2
X	Accidents and Violence	1.1	10.4
XI	Others	48.5	20.4
F	Region		
	North	11.9	11.3
	Central	14.7	16.6
	East	14.1	15.9
	Northeast	3.1	2.2
	West	19.3	19.3
	South	36.9	34.7
	Total	11535797	23014833

Source: NSSO, 1998 and NSSO, 2006

NA-not available

B- Social Factors

Among the hospitalized persons Hindus were in majority followed by Muslim community in India. STs and SCs were less in percentage of hospitalized persons in both surveys, but it increased four times in 60th round survey from earlier survey. Currently married couples were highest percentage among hospitalized persons in both the surveys followed by never married and widow/divorced and separated. It may be because widow/divorced and separated were not taking their ailing seriously than currently married.

C. Household Factors

Under household factors we have included types of structure, sources of drinking water, treatment of the water before drink, types of drainage, availability of latrine, and sources of energy for cooking. In 1998 more than three fourth (75.3 per cent) of the hospitalized members lived in kutcha house, whereas it was 33.8 per cent in 2006. In contrast to 60th round survey, majority of the hospitalized members lived in pucca structure of house. Majority of hospitalized used others source of drinking water rather than those bottled and tap water, and tube well and hand pump in earlier survey whereas in later survey just the reverse occurs. It further shows that a majority of them were those who have not treated the water before drinking. The figures in table 4.3 again indicate the lowest (11.1 per cent) per cent of the household members hospitalized have no drainage facility in the earlier survey whereas highest (46.8) per cent was reported for them in later survey. There were 56.6 per cent and 32.3 per cent of the persons hospitalized that have open drainage and covered drained facility in the house respectively in earlier survey whereas it is 34.1 19.1 per cent respectively in the later survey. More than half the persons hospitalized have latrine facility in the house and it is not much difference in the later survey. As expected a majority of those hospitalized have used firewood and chips, and LPG for source of energy for cooking in the house. Those hospitalized 24.0 per cent were using LPG.

D. Economic Factors

As expected illiterate were more hospitalized than literate ones in both the surveys. But as with education increases the per cent hospitalized decreases. Those not in labour force were hospitalized more than those in labour force in both surveys. And a majority of them have less than one hectare of land.

E. Health Factors

Hospitalized persons were 19.4 and 24.6 per cent in 52nd round survey and 30.0 and 36.0 per cent were those who ailing one day and 15 days before the survey respectively. It indicated most of them were not taken hospital treatments. In other words we can say that a majority of them who were ailing have treated out of the hospitals treatment. The members of household hospitalized due to others diseases in the earlier survey whereas later survey showed that it is because of the infectious and parasitic diseases. The next disease categories were circulatory (9.2 per cent) and respiratory (7.8 per cent) in the earlier survey and genito-urinary (10.2 per cent) and accidents and violence (10.4 per cent) in the later survey. Lowest per cent of them were those who suffered from neoplasms and endocrine, nutritional and metabolic diseases.

F. Region

Among hospitalized persons in India the highest per cent of them belong to south and west region followed by central and eastern part. A reason for this may be in south India in general, persons better educated and more health conscious.

The univariate analyses showed the simple frequency distribution. It does not show the association between the variables. For the study of association between variables we have done bivariate analyses (cross tabulation) to know the gross effect of the independent variables.

4.2. Bivariate Analysis

Univariate analysis does not show the relationship between the variables, it just shows the frequency and percentage distribution. Bivariate analysis expresses the association between the variables. This analysis was done by cross-tabulation between response and predictor variables. The cross tabulation shows the gross effect of the relationship between two variables. The association is shown between ailing one day and 15 days before the survey, and hospitalization and Demographic, Social, Household, Economic, Health Factors and Region. The chi-square test is used to show the association between the variables. In the analysis below we first show the association one day before the survey followed by analysis of ailing 15 days before the survey and hospitalization during 365 days before the survey.

4.2.1. Association between ailing one day before the survey and Demographic, Social, House hold, Economic, Health factors and Region

4.2.2. Association between Ailing 15 days before the survey and Demographic, Social, House hold, Economic, Health factors and Region

4.2.3. Association between Hospitalization during 365 days before the survey and Demographic, Social, House hold, Economic, Health factors and Region

4.2.1. Association between Ailing one day before the survey and Demographic, Social, House hold, Economic, Health factors and Region

A- Demographic Factors

The table 4.4 indicates the relationship between ailing by different factors. We find that old aged (60+ years) persons were more ailing one day before the survey in both the surveys. There were 11.7 per cent of old aged in 52nd round and 26.0 per cent in 60th round survey. The next highest category is 45-59 year old persons in both the survey. The lowest ailing was reported among 0-14 and 15-29 year old. The findings are expected as aged persons generally report more ailments. The chi-square analysis shows a highly and

significant association. Females were more ailing than males in one day before the survey, 6.2 and 9.7 per cent respectively. Within rural-urban residents, urban resident have higher ailment percentage in later survey but it was equal per cent in earlier survey.

B- Social Factors

The non-Hindu communities were more ailing than the Hindu. The percentage of ailing persons from the Hindu community was 5.4 and Muslims and other religions were 6.3 and 8.6 respectively. Further we find the percentage of SCs ailing was highest in 52nd round survey whereas in 60th round survey the other castes were highest. The percentages widow/divorced and separated ailing was highest in both surveys, but it increases more than two times in later survey followed by currently married couples.

C- Household Factors

The household factors are important for the study of the health conditions of the household members. Members of household living in pucca structure were more ailing than those living in kutcha house. These variations were not found in 52nd round survey. The highest per cent of persons reported ailing have used bottled and tap water followed by tube well and hand pump in earlier survey. But later survey found that highest were those who have not used above source of drinking water but they have used other sources of drinking water. It is surprising that the highest percentage of the household members who were ailing were those who have treated water before drinking rather than no treatment before drinking.

The further unexpected results are showing here that the members of household were more ailing who have covered drainage facility in the house than open and no drainage in the house. There is not much difference between the open and no drainage house. We have again found in both surveys members of household were more ailing have latrine facility in the house than those not having latrine facility in the house. We find 7.4 per cent of the household members who were ailing have used LPG for source

of energy for cooking whereas those ailing and have used other source and firewood and chips for the same were 6.0 and 5.1 per cent respectively (table 4.4).

Table 4.4: Association between ailing one day before the survey and Demographic, Social, Household, Economic factors, Health and Region

S.No.	Factor	Ailing one day before the survey	
		52 nd round	60 th round
A.	Demographic		
1	Age Group		
	0-14	1.9	3.2
	15-29	1.8	2.6
	30-44	2.8	5.1
	45-59	4.4	9.3
	60+	11.7	25.8
2	Sex		
	Male	2.8	5.3
	Female	3.0	6.2
3	Residence		
	Rural	2.9	5.49
	Urban	2.9	6.79
B.	Social		
1	Religion		
	Hindu	NA	5.4
	Muslim	NA	6.3
	Others	NA	8.6
2	Social Group		
	STs	2.2	2.9
	SCs	4.3	5.4
	OBCs	--	5.4
	Others	2.8	7.0
3	Marital Status		
	Never married	1.8	3.1
	Currently married	3.5	7.1
	Widow/ Divorced and Separated	7.6	18.2
C.	Household		
1	Type of structure		
	Pucca	4.3	6.4
	Kutchha	4.6	4.8
2	Source of Drinking Water		
	Bottled and tap water	4.9	6.1
	Tube well and Hand pump	4.2	5.2
	Others	2.6	6.6
3	Water Treated		

	Yes	NA	7.2
	No	NA	5.2
4	Type of Drainage		
	Open	4.0	5.5
	Covered	5.1	7.1
	No drainage	4.5	5.5
5	Latrine		
	Latrine	4.6	7.5
	No latrine	4.5	4.7
6	Source of Energy for Cook		
	Firewood and chips	NA	5.1
	LPG	NA	7.4
	Others	NA	6.0
D.	Economic		
1	Education		
	Illiterate	3.3	6.7
	Up to Primary	2.4	4.8
	Middle and above	2.4	5.2
2	Activity Status		
	Labour force	2.6	4.9
	Not in Labour force	3.0	6.2
3	Land Holding		
	.005-.010 HA	NA	5.9
	.020-1.000 HA	NA	5.9
	1.000+	NA	4.8
E.	Disease		
I	Infectious and Parasitic	7.4	18.0
II	Neoplasms	14.5	40.4
III	Endocrine, Nutritional and Metabolic	21.1	55.4
IV	Neuro-Psychiatric	12.8	48.4
V	Eye	25.6	39.3
Vi	Circulatory	18.7	55.6
VII	Respiratory	13.3	50.1
VIII	Digestive	15.2	26.1
IX	Genito-Urinary	16.7	25.5
X	Accidents and Violence	4.8	24.9
XI	Others	9.2	24.7
F	Region		
	North	2.9	5.0
	Central	2.8	5.4
	East	2.6	4.7
	Northeast	2.3	3.4
	West	2.6	6.0
	South	3.4	7.6

Source: NSSO, 1998 and NSSO, 2006

NA-not available

D- Economic Factors

We have found illiterate persons were more ailing than literate ones in both surveys. But among literates high educational level showed more ailing than low levels of education. It may be possible because high educated persons were reporting higher ailing than those of low levels of education. Labour forces were more ailing than those were labour force in both the survey. There were 6.2 per cent not in labour force population were ailing in 60th round which is more than two times from 52nd round survey. Similar results are also found among the labour force in both the surveys. The persons who have less than one hectare land holding were more ailing than those having more than one hectare land.

E. Health Factors

Persons who were ailing one day before the survey due to all categories of the diseases in the 52nd round survey increased two to three times more increased in 60th round survey. For example ailing due to infectious and parasitic diseases were 7.4 per cent in earlier round of survey which is increased by 18.0 per cent in later round survey. The neuro-psychiatric was about 13.0 per cent in earlier survey which more the 48.0 per cent in the later survey. We have found highest percentage of ailing due to Eye (25.6 per cent), endocrine, nutritional and metabolic (21.1 per cent), circulatory (18.7 per cent), genito-urinary (16.7 per cent) and digestive system diseases (15.2 per cent) in the 52nd round survey. In 60th round highest was due to circulatory diseases (55.6 per cent), followed by endocrine, nutritional and metabolic (55.4 per cent), respiratory (50.1 per cent), neuro-psychiatric (48.4 per cent) and neoplasms (40.4 per cent). These data show a new emerging pattern of diseases in India.

F. Region

We again found in both the survey South Indian people were ailing highest followed by west and central region. Lowest percentages of ailing were reported from the Northeast part of India.

In case of all the variables described above the chi-square shows that associations were highly significant.

4.2.2. Association between Ailing 15 days before the survey and Demographic, Social, House hold, Economic, Health factors and Region

A- Demographic Factors

The figures in table 4.5 showed the relationship between ailing 15 days before the survey and different Factors. Old aged (60+) persons were more ailing followed by 45-59 years in both the surveys. And it was lowest in 15-29 year age group people. Females were more ailing in urban areas than males in rural areas. This variation was not much in the 52nd round survey.

B- Social Factors

We further find non-Hindu communities were more ailing. The Hindu was only 8.8 per cent ailing and Muslims and other religion were 9.9 and 12.3 per cent ailing respectively. In earlier round survey, SCs showed higher ailing than STs and other castes people whereas other castes was highest in later round survey. There were 10.6 per cent other castes person were ailing in 60th round which is two times more than earlier survey. Widow/divorced and separated were reported highest ailing in both surveys. They represented 11.6 per cent in 52nd round and 23.4 per cent in 60th round survey. Ailing currently married persons were 5.8 and 10.1 per cent in both surveys respectively.

C- Household Factors

The earlier round survey showed the members of household living in kutcha house represent highest ailing whereas the later survey showed reverse picture. Those person who used bottled and tap water, and tube well and hand pump water for drinking reported higher ailing than those who used other sources of drinking water in the 52nd round survey and the reverse picture found in the later survey. It also found those who used treated water for drinking were more ailing than not treated water before drink. Around 11.0 per cent persons ailing have used treated water for drinking whereas 8.6 per cent of them were those who used untreated water for drinking. In both the surveys the members of household who were more ailing 15 days before the survey have covered drainage system in the house and after that household with no drainage. The percentage of household members having latrine facility in the house in both surveys was higher than those not having latrine facility in the house. LPG users again showed the highest per cent ailing than other sources of energy used for cooking. There were 11.0 per cent of the household members ailing who have used LPG and firewood and chips represents 8.4 per cent.

Table 4.5: Association between ailing 15 days before the survey and Demographic, Social, Household, Economic factors, Health and Region

S.No	Factor	Ailing 15 days before the survey	
		52 nd round	60 th round
A.	Demographic		
1	Age Group		
	0-14	4.7	7.4
	15-29	3.5	4.9
	30-44	5.1	7.9
	45-59	7.0	12.8
	60+	16.3	31.0
2	Sex		
	Male	5.2	8.6
	Female	5.6	9.7
3	Residence		
	Rural	5.4	8.8

	Urban	5.3	9.9
B.	Social		
1	Religion		
	Hindu	NA	8.8
	Muslim	NA	9.9
	Others	NA	12.3
2	Social Group		
	STs	5.0	5.8
	SCs	7.1	8.8
	OBCs	--	8.8
	Others	5.3	10.6
3	Marital Status		
	Never married	4.4	6.7
	Currently married	5.8	10.1
	Widow/ Divorced and Separated	11.6	23.4
C.	Household		
1	Type of structure		
	Pucca	6.7	9.8
	Kutchha	7.6	8.1
2	Source of Drinking Water		
	Bottled and tap water	7.5	9.2
	Tube well and Hand pump	6.9	8.6
	Others	5.1	10.5
3	Water Treated		
	Yes	NA	10.9
	No	NA	8.6
4	Type of Drainage		
	Open	6.6	8.7
	Covered	7.8	10.5
	No drainage	7.7	9.0
5	Latrine		
	Latrine	7.6	11.3
	No latrine	7.2	7.9
6	Source of Energy for Cook		
	Firewood and chips	NA	8.4
	LPG	NA	10.6
	Others	NA	9.8
D.	Economic		
1	Education		
	Illiterate	6.1	10.8
	Up to Primary	4.8	7.8
	Middle and above	4.5	7.8
2	Activity Status		
	Labour force	4.6	7.6
	Not in Labour force	5.8	10.0

3	Land Holding		
	.005-.010 HA	NA	9.4
	.020-1.000 HA	NA	9.5
	1.000+	NA	7.8
E.	Disease		
I	Infectious and Parasitic	11.1	24.8
II	Neoplasms	18.5	46.5
III	Endocrine, Nutritional and Metabolic	24.5	58.4
IV	Neuro-Psychiatric	18.7	54.3
V	Eye	28.6	45.2
Vi	Circulatory	24.3	60.0
VII	Respiratory	16.0	56.8
VIII	Digestive	17.8	34.2
IX	Genito-Urinary	22.5	31.6
X	Accidents and Violence	6.5	29.3
XI	Others	12.4	30.4
F	Region		
	North	5.0	7.6
	Central	5.5	8.8
	East	5.0	8.2
	Northeast	7.3	7.8
	West	4.6	9.3
	South	6.0	11.2

Source: NSSO, 1998 and NSSO, 2006

NA-not available

D- Economic Factors

The highest per cent ailing 15 days before the survey was found among the illiterate persons in both surveys. The primary levels of education and higher levels of education do not show variation in the ailing. Again we have found that those not in labour force have higher per cent ailing than those in labour force in both surveys. There were 4.6 per cent of labour forces in 52nd round and 7.6 per cent in the 60th round were ailing whereas not in labour force were 5.8 per cent and 10.0 per cent in both surveys respectively. Again low land holding represents high ailing percentage. There were 9.5 per cent ailing who have less than one hectare land whereas 7.8 per cent were those who had more than one hectare land holding.

E. Health Factors

The 52nd round survey reported highest percentage of persons ailing 15 days before the survey and these were due to the diseases such as eye diseases (28.6 per cent), endocrine (24.5 per cent), circulatory (24.3 per cent), genito-urinary (22.5 per cent), neuro-psychiatric (18.7 per cent) and neoplasms (18.5 per cent). But we have found in 60th round survey highest ailing was due to circulatory (60.0 per cent), followed by endocrine (58.4 per cent), respiratory (56.8 per cent) and neuro-psychiatric (54.3 per cent). It indicates that there is a some diseases increase in the later survey.

F. Region

The 52nd round survey showed highest ailing was reported by Northeast region followed by South Indian region. But later survey showed the South region people having higher ailing (11.2 per cent) followed by Western (9.3 per cent) part of India.

All the results showed highly significant association between the variables.

4.2.3. Association between Hospitalization during 365 days before the survey and Demographic, Social, House hold, Economic, Health factors and Region

Earlier we have discussed the factors influencing ailing among the household members. Now we are discussing the factors influencing hospitalization and its association with different variables.

A- Demographic Factors

The figures in table 4.6 indicate the older persons were more hospitalized than younger ones in both the survey. There were 3.8 per cent of them in 52nd round and 6.1 per cent in later round survey hospitalized followed by 45-59 year age group people. Lowest percentage of the 0-14 year age group persons were hospitalized during 365 days

before the survey. There was not any difference in males and females hospitalization in both the survey. Urban residents were reported more hospitalization than rural residents.

Table 4.6: Association between Hospitalization and Demographic, Social, Household, Economic, Health factors and Region

S.No.	Factor	Hospitalization during 365 days	
		52 nd round	60 th round
A.	Demographic		
1	Age Group		
	0-14	0.8	1.3
	15-29	1.2	1.9
	30-44	1.5	2.6
	45-59	2.3	4.0
	60+	3.8	6.1
2	Sex		
	Male	1.4	2.4
	Female	1.3	2.4
3	Residence		
	Rural	1.2	2.2
	Urban	1.9	3.0
B.	Social		
1	Religion		
	Hindu	NA	2.3
	Muslim	NA	2.3
	Others	NA	3.8
2	Social Group		
	STs	1.3	2.7
	SCs	2.0	1.5
	OBCs	--	2.2
	Others	1.3	2.5
3	Marital Status		
	Never married	0.8	1.4
	Currently married	1.9	3.2
	Widow/ Divorced and Separated	2.4	4.6
C.	Household		
1	Type of structure		
	Pucca	1.8	2.8
	Kutchha	2.2	1.9
2	Source of Drinking Water		
	Bottled and tap water	2.4	2.9
	Tube well and Hand pump	1.6	1.8
	Others	1.3	3.1
3	Water Treated		

	Yes	NA	3.6
	No	NA	2.0
4	Type of Drainage		
	Open	1.8	2.2
	Covered	2.4	3.0
	No drainage	2.3	2.4
5	Latrine		
	Latrine	2.8	3.3
	No latrine	1.8	1.9
6	Source of Energy for Cook		
	Firewood and chips	NA	2.2
	LPG	NA	3.3
	Others	NA	2.0
D.	Economic		
1	Education		
	Illiterate	1.2	2.3
	Up to Primary	1.4	2.1
	Middle and above	1.7	2.8
2	Activity Status		
	Labour force	1.4	2.5
	Not in Labour force	1.3	2.3
3	Land Holding		
	.005-.010 HA	NA	2.6
	.020-1.000 HA	NA	2.4
	1.000+ HA	NA	2.2
E.	Health		
1	Ailing One day before survey		
	Yes	19.4	12.7
	No	2.6	1.8
2	Ailing 15 days before survey		
	Yes	24.6	9.5
	No	5.1	1.7
F	Indian Region		
	North	1.3	2.2
	Central	0.8	1.5
	East	0.9	1.8
	Northeast	1.2	1.5
	West	1.8	3.1
	South	2.1	3.8

Source: NSSO, 1998 and NSSO, 2006

NA-not available

B- Social Factors

Among Hindu population 2.3 per cent were hospitalized and same picture was present among Muslim community. But, within other religions (Christian, Sikh, Jain, Buddhist, Zoroastrianism, and others) reported about 4.0 per cent of them were hospitalized. According to 52nd round 1.3 per cent each STs and others caste were hospitalized whereas only 2.0 per cent of SCs were hospitalized. In 60th round survey there is a slight variation in hospitalization among STs, OBCs and other caste persons, but SCs were lowest in this category. In both the surveys we have found high per cent of widow/divorced and separated persons have used hospital treatments followed by currently married women. Less than one per cent of the never married persons were hospitalized in earlier round of the survey which is 1.4 per cent in the later round survey.

C- Household Factors

According the earlier round survey 2.2 per cent of the members of household living in kutcha house hospitalized and 1.8 per cent those living in pucca house were hospitalized but later round survey showed reverse pictures i.e., 2.8 per cent and 1.9 per cent of the members hospitalized living in pucca and kutcha house respectively. The lowest per cent of those who have tube well and hand pump water for drinking were hospitalized and highest were those who have used bottled and tap water and 3.6 per cent of them hospitalized used treated water for drinking and 2.0 per cent of them hospitalized did not use treated water for drinking. There were not many differences in hospitalization for drainage facilities; 2.3 per cent of the household members hospitalized have no drainage facility in the house whereas 2.4 and 1.8 per cent were those who have covered and open drainage facility in house in the earlier survey. The 60th round survey showed 2.2, 3.0 and 2.4 per cent of them hospitalized have open, covered and no drainage facility in house. The household members were more hospitalized when latrine facilities in the house than those having no latrine facility have. The highest percentage of the household members hospitalized, have used LPG for cooking in house, and 3.3 per cent of them were hospitalized.

D- Economic Factors

Highest education level showed positive relation with hospitalization. The high educated peoples were more hospitalized than primary level and illiterate in both the rounds. Both surveys showed similar picture of hospitalization among those in the labour force and not in labour force. And a slight difference was found among small and large land holding. The persons having less than one hectare land were more hospitalized than those having more than one hectare land.

E. Health Factors

According to the 52nd round survey the persons who were Ailing one day and 15 days before the survey 19.4 and 24.6 per cent of them were hospitalized respectively. And 60th round survey showed 12.7 and 9.5 per cent of the population hospitalized, who have been ailing one day and 15 days before the survey respectively, whereas those not ailing in both the cases, are 1.7 and 1.8 per cent hospitalized respectively. In the data sets, the disease pattern does not clear have much meaning because all of them hospitalized because of various diseases.

F- Indian Region

Both surveys showed the persons living in South and West India. people more hospitalized than other parts of India. Among the persons living in South and West India, 3.8 and 3.1 per cent of them were hospitalized whereas for North Indians it is only 2.2 per cent. And rest of the Indians hospitalized were about 1.5-1.8 per cent in 60th round survey.

4.3. Correlation coefficients between the Variables

In this study independent variables are categorical and nominal in nature. We have re-categorized them into dichotomous variables, with the assumption that the dichotomy will fairly represent an interval scaled variable. The correlation indicates the strength and direction of a linear relationship between two variables. We have calculated Pearson correlation; it reflects the degree of linear relationship between two variables. The range of correlation is from +1 to -1. A correlation of +1 means that there is a perfect positive linear relationship between variables and -1 means that there is a perfect negative linear relationship. A correlation 0 means there is no linear relationship between the two variables.

Table 4.7 and 4.8 shows correlation between variables (residence, sex, water treated, religion, type of structure, types of latrine, labour status, hospitalization, ailing one day and 15 days before the survey, marital status, age group, social group, educational level, type of drainage and land holding) shows both +ve and -ve relation and significant at 1.0 per cent level (2-tail). The correlation between ailing (ailing one and 15 days before the survey) and all other variables are also given in the in tables.

In both surveys there is high correlation between ailing for one day and for 15 days. In the 60th round correlation between thee tow variables is 0.812 and 52nd round it is 0.717. But with hospitalization in case of both these variables there is correlation coefficient is not high. Among the independent variables the correlation are not high. There is only one correlation between marriage and age in 52nd and 60th round which is high. It is about 0.616 in both rounds. As the correlation among the independent variables is not high, so, we do not have the problems of multi-collinearity.

Table 4.7: Bi-variate Correlation Coefficients matrix (52nd round)

Variable		Residence	Sex	Age	Marital statuses	Education	Activity status	Social group	Drinking water
Residence	Pearson correlation	1	-.008**	.016**	-.007**	.226**	.047**	.051**	-.125**
	Sig. (2-tailed)	.	.000	.000	.000	.000	.000	.000	.000
Gender	Pearson	-.008**	1	.006**	.043**	-.198**	.350**	.074**	.060**
	Sig. (2-tailed)	.000	.	.000	.000	.000	.000	.000	.000
Age	Pearson	.016**	.006**	1	.614**	-.093**	-.392**	-.187**	-.300**
	Sig. (2-tailed)	.000	.000	.	.000	.000	.000	.000	.000
Marital statuses	Pearson	-.007**	.043**	.614**	1	-.032**	-.442**	-.187**	-.283**
	Sig. (2-tailed)	.000	.000	.000	.	.000	.000	.000	.000
Education level	Pearson	.226**	-.198**	-.093**	-.032**	1	-.050**	.066**	-.050**
	Sig. (2-tailed)	.000	.000	.000	.000	.	.000	.000	.000
Activity status	Pearson	.047**	.350**	-.392**	-.442**	-.050**	1	.199**	.230**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.	.000	.000
Social group	Pearson	.051**	.074**	-.187**	-.187**	.066**	.199**	1	.345**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.	.000
Drinking water	Pearson	-.125**	.060**	-.300**	-.283**	-.050**	.230**	.345**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.
Type of structure	Pearson	.177**	.060**	-.031**	-.025**	.087**	.104**	.078**	-.107**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000
Type of drainage	Pearson	.384**	.039**	-.038**	-.023**	.179**	.127**	.152**	-.264**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000
Type of latrine	Pearson	-.574**	-.091**	.048**	.043**	-.359**	-.228**	-.204**	.267**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000
Hospitalized	Pearson	.023**	-.003**	.050**	.039**	.014**	-.005**	-.008**	-.025**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000
Ailing 15 days	Pearson	-.002**	.010**	.068**	.015**	-.031**	.026**	-.012**	-.033**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000
Ailing one day	Pearson	.000**	.007**	.081**	.033**	-.027**	.011**	-.012**	-.042**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000

** Correlation is significant at the 0.01 level (2-tailed).

Contd...

Table contd...4. 7: Bi-variate Correlation Coefficients matrix (52nd round)

Variables		Type of structure	Type of drainage	Type of latrine	Hospitalized	Ailing 15 days	Ailing one day
Residence	Pearson correlation	.177**	.384**	-.574**	.023**	-.002**	.000**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000
Gender	Pearson	.060**	.039**	-.091**	-.003**	.010**	.007**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000
Age	Pearson	-.031**	-.038**	.048**	.050**	.068**	.081**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000
Marital statuses	Pearson	-.025**	-.023**	.043**	.039**	.015**	.033**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000
Education level	Pearson	.087**	.179**	-.359**	.014**	-.031**	-.027**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000
Activity status	Pearson	.104**	.127**	-.228**	-.005**	.026**	.011**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000
Social group	Pearson	.078**	.152**	-.204**	-.008**	-.012**	-.012**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000
Drinking water	Pearson	-.107**	-.264**	.267**	-.025**	-.033**	-.042**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000
Type of structure	Pearson	1	.105**	-.224**	.013**	.015**	.007**
	Sig. (2-tailed)	.	.000	.000	.000	.000	.000
Type of drainage	Pearson	.105**	1	-.368**	-.011**	-.016**	-.015**
	Sig. (2-tailed)	.000	.	.000	.000	.000	.000
Type of latrine	Pearson	-.224**	-.368**	1	-.032**	-.007**	-.002**
	Sig. (2-tailed)	.000	.000	.	.000	.000	.000
Hospitalised	Pearson	.013**	-.011**	-.032**	1	.100**	.116**
	Sig. (2-tailed)	.000	.000	.000	.	.000	.000
Ailing 15 days	Pearson	.015**	-.016**	-.007**	.100**	1	.717**
	Sig. (2-tailed)	.000	.000	.000	.000	.	.000
Ailing one day	Pearson	.007**	-.015**	-.002**	.116**	.717**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.

** Correlation is significant at the 0.01 level (2-tailed).

Table 4.8: Bi-variate Correlation Coefficients matrix (60th round)

Variable		Residence	Sex	Water	Religion	Structure	Latrine	Labour	Hospitalize
Residence	Pearson Correlation	1	-.001	-.197(**)	.066(**)	-.331(**)	-.494(**)	.040(**)	-.013(**)
	Sig. (2-tailed)	.	.521	.000	.000	.000	.000	.000	.000
Sex	Pearson Correlation	-.001	1	-.011(**)	.005(**)	.000	-.002	.363(**)	.009(**)
	Sig. (2-tailed)	.521	.	.000	.003	.866	.280	.000	.000
Water treated	Pearson Correlation	-.197(**)	-.011(**)	1	-.055(**)	.120(**)	.255(**)	.010(**)	.023(**)
	Sig. (2-tailed)	.000	.000	.	.000	.000	.000	.000	.000
Religion	Pearson Correlation	.066(**)	.005(**)	-.055(**)	1	.011(**)	-.179(**)	.027(**)	.010(**)
	Sig. (2-tailed)	.000	.003	.000	.	.000	.000	.000	.000
Type of structure	Pearson Correlation	-.331(**)	.000	.120(**)	.011(**)	1	.360(**)	-.042(**)	.019(**)
	Sig. (2-tailed)	.000	.866	.000	.000	.	.000	.000	.000
Types of latrine	Pearson Correlation	-.494(**)	-.002	.255(**)	-.179(**)	.360(**)	1	-.050(**)	.021(**)
	Sig. (2-tailed)	.000	.280	.000	.000	.000	.	.000	.000
Labour status	Pearson Correlation	.040(**)	.363(**)	.010(**)	.027(**)	-.042(**)	-.050(**)	1	.015(**)
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.	.000
Hospitalized	Pearson Correlation	-.013(**)	.009(**)	.023(**)	.010(**)	.019(**)	.021(**)	.015(**)	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.
Ailing 15 days	Pearson Correlation	-.018(**)	-.016(**)	.034(**)	.000	.035(**)	.042(**)	-.042(**)	.216(**)
	Sig. (2-tailed)	.000	.000	.000	.882	.000	.000	.000	.000
Ailing one day	Pearson Correlation	-.026(**)	-.014(**)	.032(**)	-.001	.044(**)	.044(**)	-.031(**)	.235(**)
	Sig. (2-tailed)	.000	.000	.000	.607	.000	.000	.000	.000
Marital status	Pearson Correlation	-.004(*)	-.038(**)	.018(**)	.047(**)	.024(**)	.016(**)	.413(**)	.086(**)
	Sig. (2-tailed)	.014	.000	.000	.000	.000	.000	.000	.000
Age group	Pearson Correlation	.034(**)	.012(**)	-.043(**)	-.032(**)	-.028(**)	-.050(**)	-.361(**)	-.113(**)
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000
Social group	Pearson Correlation	.125(**)	-.001	-.037(**)	-.013(**)	-.209(**)	-.164(**)	.036(**)	-.011(**)
	Sig. (2-tailed)	.000	.546	.000	.000	.000	.000	.000	.000
Education level	Pearson Correlation	.183(**)	-.165(**)	-.138(**)	.025(**)	-.170(**)	-.265(**)	-.092(**)	.016(**)
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000
Type of drainage	Pearson Correlation	-.388(**)	.006(**)	.081(**)	-.036(**)	.356(**)	.381(**)	-.057(**)	.003
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.057

**Correlation is significant at the 0.01 level (2-tailed). *Correlation is significant at the 0.05 level (2-tailed).

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Table contd 4.8: Bi-variate Correlation Coefficients matrix (60th round)

Variable		Ailing 15 days	Ailing One day	Marital Status	Age	Social Group	Education	Drainage
Residence	Pearson Correlation	-.018(**)	-.026(**)	-.004(*)	.034(**)	.125(**)	.183(**)	-.388(**)
	Sig. (2-tailed)	.000	.000	.014	.000	.000	.000	.000
Sex	Pearson Correlation	-.016(**)	-.014(**)	-.038(**)	.012(**)	-.001	-.165(**)	.006(**)
	Sig. (2-tailed)	.000	.000	.000	.000	.546	.000	.000
Water treated	Pearson Correlation	.034(**)	.032(**)	.018(**)	-.043(**)	-.037(**)	-.138(**)	.081(**)
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000
Religion	Pearson Correlation	.000	-.001	.047(**)	-.032(**)	-.013(**)	.025(**)	-.036(**)
	Sig. (2-tailed)	.882	.607	.000	.000	.000	.000	.000
Type of structure	Pearson Correlation	.035(**)	.044(**)	.024(**)	-.028(**)	-.209(**)	-.170(**)	.356(**)
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000
Types of latrine	Pearson Correlation	.042(**)	.044(**)	.016(**)	-.050(**)	-.164(**)	-.265(**)	.381(**)
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000
Labour status	Pearson Correlation	-.042(**)	-.031(**)	.413(**)	-.361(**)	.036(**)	-.092(**)	-.057(**)
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000
Hospitalized	Pearson Correlation	.216(**)	.235(**)	.086(**)	-.113(**)	-.011(**)	.016(**)	.003
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.057
Ailing 15 days	Pearson Correlation	1	.812(**)	.046(**)	-.149(**)	-.034(**)	.068(**)	.005(**)
	Sig. (2-tailed)	.	.000	.000	.000	.000	.000	.003
Ailing one day	Pearson Correlation	.812(**)	1	.067(**)	-.172(**)	-.037(**)	.051(**)	.013(**)
	Sig. (2-tailed)	.000	.	.000	.000	.000	.000	.000
Marital status	Pearson Correlation	.046(**)	.067(**)	1	-.621(**)	-.025(**)	-.008(**)	.004(**)
	Sig. (2-tailed)	.000	.000	.	.000	.000	.000	.006
Age group	Pearson Correlation	-.149(**)	-.172(**)	-.621(**)	1	.034(**)	-.100(**)	-.013(**)
	Sig. (2-tailed)	.000	.000	.000	.	.000	.000	.000
Social group	Pearson Correlation	-.034(**)	-.037(**)	-.025(**)	.034(**)	1	.103(**)	-.174(**)
	Sig. (2-tailed)	.000	.000	.000	.000	.	.000	.000
Education level	Pearson Correlation	.068(**)	.051(**)	-.008(**)	-.100(**)	.103(**)	1	-.143(**)
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.	.000
Type of drainage	Pearson Correlation	.005(**)	.013(**)	.004(**)	-.013(**)	-.174(**)	-.143(**)	1
	Sig. (2-tailed)	.003	.000	.006	.000	.000	.000	.

**Correlation is significant at the 0.01 level (2-tailed). *Correlation is significant at the 0.05 level (2-tailed).

4.4. Multivariate Analysis

The logistic regression shows the net effect of the independent variables on the dependent variables. In this case, all the three dependent variables namely: ailing one day before the survey, ailing 15 days before the survey and hospitalization during 365 days have dichotomous ('yes' and 'no') values and thus binary logistic is model of the choice. The odds ratios of binary logistic regression have been given under following headings;

4.4.1. Odds Ratio for ailing one day before the survey

4.4.2. Odds Ratio for ailing 15 days before the survey

4.4.3. Odds Ratio for hospitalized during 365 days before the survey

4.4.1. Odds Ratio for ailing one day before the survey

The table 4.9 shows the odds ratio for the ailing one day before the survey. In the NSSO survey the respondents asked, whether he/she ailing one day before the survey. The response category was yes and no. The code '1' is assigned for 'yes' and '0' for 'no' response. The odds ratio shows old age (60+ years) population more than 14 times more likely in 60th round and nine times in 52nd round survey ailing than younger (reference category) age population, followed by 45-59 year and 30-44 year age group who are more likely to be ailing one day before the survey. But 15-29 year age group less likely to be ailing one day before the survey. Males were more likely to be ailing than females. Rural residents were more likely to be ailing than urban resident. All the odds ratios were highly significant.

The Muslim and other religions, about 21.0 and 45.0 per cent were more likely ailing than Hindu population in India. The STs/SCs and OBCs population were less likely to be ailing than other castes population. Currently married and widow/divorced and separated persons more likely to be ailing than never married population by about 23.0 and 33.0 per cent respectively.

Table 4.9: Odds Ratio for ailing one day before the Survey

S.No.	Factor	52 nd round		60 th round	
		Exp (B)	Significant	Exp (B)	Significant
A.	Demographic				
1	Age Group				
	0-14 ®	--	.000	--	.000
	15-29	2.901	.000	0.976	.000
	30-44	3.549	.000	1.960	.000
	45-59	5.716	.000	3.513	.000
	60+	13.913	.000	9.434	.000
2	Sex				
	Male ®	--	--	--	--
	Female	0.862	.000	0.842	.000
3	Residence				
	Rural ®	--	--	--	--
	Urban	0.826	.000	0.964	.000
B.	Social				
1	Religion				
	Hindu ®	NA		--	.000
	Muslim	NA		1.214	.000
	Others	NA		1.448	.000
2	Social Group				
	Others ®	--	.000	--	.000
	STs	0.537	.000	0.527	.000
	SCs	0.977	.000	0.952	.000
	OBCs	NA		0.825	.000
3	Marital Status				
	Never married ®	--	.000	--	.000
	Currently married	0.994	.000	1.235	.000
	Widow/ Divorced and Separated	1.108	.000	1.328	.000
C.	Household				
1	Type of structure				
	Pucca ®	--	--	--	--
	Kutchra	1.020	.000	0.943	.000
2	Source of Drinking Water				
	Bottled and tap water ®	--	.000	--	.000
	Tube well and Hand pump	0.904	.000	1.179	.000
	Others	0.901	.000	1.258	.000
3	Water Treated				
	Yes ®	NA		--	--
	No	NA		0.850	.000
4	Type of Drainage				
	Open ®	--	.000	--	.000

	Covered	1.177	.000	1.015	.000
	No drainage	1.231	.000	1.191	.000
5	Latrine				
	Latrine ®	--	--	--	--
	No latrine	0.992	.000	0.682	.000
6.	Source of Energy for cook				
	Firewood and chip	NA		--	.000
	LPG	NA		1.097	.000
	Others	NA		1.315	.000
D.	Economic				
1	Education				
	Illiterate ®	--	.000	--	.000
	Upto Primary	1.189	.000	0.884	.000
	Middle and above	1.077	.000	0.824	.000
2	Activity Status				
	Labour force ®	--	--	--	--
	Not in Labour force	1.774	.000	1.892	.000
E	Region				
	North ®	--	.000	--	.000
	Central	0.761	.000	1.311	.000
	East	0.749	.000	0.961	.000
	Northeast	0.484	.000	0.699	.000
	West	0.798	.000	1.281	.000
	South	0.994	.000	1.639	.000
	Constant	0.009	.000	0.021	.000

Source: NSSO, 1998 and NSSO, 2006

NA-not available

In household factors, the persons living in kutcha house were less likely to be ailing than those living in pucca house. The odds ratio of source of drinking water shows, those people used drinking water from tube well/hand pump and others source of water, were more likely to be ailing than those who have used bottled and tap water in 60th round survey whereas 52nd round survey showed reverse ratio. Those who have used treated drinking water 15.0 per cent were more likely to be ailing in comparison to not treated water before drinking. About 20.0 per cent of the population were more likely to be ailing one day, where no drainage facilities than reference category in both surveys. The household's members less likely to be ailing have no latrine facility in house. The household member used LPG and other source of energy for cooking more ailing than those used firewood and chip.

According to 60th round survey illiterate are more likely to be ailing than literate, but 52nd round survey showed just opposite ratio. And about two times non labour force more likely to be ailing than labour force in India.

According to 52nd round survey all the regions were less likely to be ailing one day before the survey than North region. But in 60th round survey the south, west and central Indian people more ailing than north Indian people. The south Indian peoples about 64.0 per cent more likely to be ailing than north Indian. All the Odds Ratios are highly significant.

4.4.2. Odds Ratio for ailing 15 days before the survey

The odds ratio for ailing 15 days before the survey is given in table 4.10. In demographic variables, the age group shows that aged persons about three times in 52nd round and five times more likely to be ailing 15 days before the survey as compared to reference group whereas 50.0 per cent and 97.0 per cent more likely to be ailing 45-59 year old in both the survey respective. But, 15-29 year aged about 24.0 per cent more likely to be ailing than younger. The table 4.8 again shows males less likely to be ailing than females. And rural residents were more likely to be ailing than urban residents.

Muslims and other religions population were more likely to be ailing than Hindu community. About 11.0 per cent of the Muslim and 36.0 per cent of the other religious communities were more likely to be ailing than Hindu. The STs, SCs and OBCs were less likely to be ailing than reference category in the 60th round whereas SCs were more likely to be ailing in 52nd round survey. The currently married and widow/ divorced and separated were more ailing than never married in later survey. In contrast to that currently married and widow were less likely to be ailing in earlier survey. Widow/divorced and separated about 35.0 per cent more likely to be ailing than reference category.

Table 4.10: Odds Ratio for ailing 15 days before the survey

S.No.	Factor	52 nd round		60 th round	
		Exp (B)	Significant	Exp (B)	Significant
A.	Demographic				
1	Age Group				
	0-14 ®	--	.000	--	.000
	15-29	0.93	.000	0.62	.000
	30-44	1.038	.000	1.224	.000
	45-59	1.506	.000	1.970	.000
	60+	3.414	.000	4.854	.000
2	Sex				
	Male ®	--	--	--	--
	Female	0.929	.000	0.880	.000
3	Residence				
	Rural ®	--	--	--	--
	Urban	0.883	.000	0.954	.000
B.	Social				
1	Religion				
	Hindu ®	NA		--	.000
	Muslim	NA		1.106	.000
	Others	NA		1.363	.000
2	Social Group				
	Others ®	--	.000	--	.000
	STs	0.749	.000	0.605	.000
	SCs	1.019	.000	0.940	.000
	OBCs	NA		0.853	.000
3	Marital Status				
	Never married ®	--	.000	--	.000
	Currently married	0.836	.000	1.192	.000
	Widow/ Divorced and Separated	0.999	.000	1.353	.000
C.	Household				
1	Type of structure				
	Pucca ®	--	--	--	--
	Kutchra	1.103	.000	.951	.000
2	Source of Drinking Water				
	Bottled and tap water ®	--	.000	--	.000
	Tube well and Hand pump	0.962	.000	1.163	.000
	Others	1.007	.000	1.266	.000
3	Water Treated				
	Yes ®	NA		--	--
	No	NA		0.854	.000

4	Type of Drainage				
	Open ®	--	.000	--	.000
	Covered	1.095	.000	1.027	.000
	No drainage	1.187	.000	1.187	.000
5	Latrine				
	Latrine ®	--	--	--	--
	No latrine	0.982	.000	0.682	.000
6.	Source of Energy for Cooking				
	Firewood and chip	NA		--	.000
	LPG	NA		1.058	.000
	Others	NA		1.277	.000
D.	Economic				
1	Education				
	Illiterate ®	--	.000	--	.000
	Upto Primary	1.162	.000	0.793	.000
	Middle and above	1.102	.000	0.772	.000
2	Activity Status				
	Labour force ®	--	--	--	--
	Not in Labour force	1.655	.000	1.656	.000
E	Region				
	North ®	--	.000	--	.000
	Central	0.922	.000	1.364	.000
	East	0.901	.000	1.117	.000
	Northeast	0.885	.000	1.066	.000
	West	0.881	.000	1.325	.000
	South	1.081	.000	1.626	.000
	Constant	0.053	.000	0.054	.000

Source: NSSO, 1998 and NSSO, 2006

NA-not available

According to 52nd round survey the persons living in kutcha house were more likely to be ailing whereas they were less likely to be ailing in the later survey. The people who have used tube well and hand pump for source of drinking water were more likely to be ailing than those using bottled and tap water in both the surveys. They were about 15.0 per cent less likely to be ailing than those who have used treated water for drinking. The household members who were more likely to be ailing have covered and no drained facilities in the house than those that have open drained system. Those having latrine facility in the house were less likely to be ailing. Compared with those using firewood and chips those who are using LPG were 6.0 per cent more likely to be ailing and other sources of energy for cooking were 27 per cent more likely to be ailing.

According to 60th round survey illiterate were about 22.0 per cent more likely to be ailing than literate whereas in 52nd round survey we have found literate were more likely to be ailing. And persons in non labour force were more likely to be ailing than those in labour force.

The earlier survey show that person in South region had a slightly higher chance of ailing than persons in other region. In the later survey the odds ratio or ailing for those in South increased much more than persons in other region. The entire odds ratios for ailing 15 days before the survey are highly significant.

4.5.3. Odds Ratio for hospitalized during 365 days before the survey

The odds ratios of logistic regression for hospitalized during 365 days before the survey are explained in the table 4.11. The odds ratio for age group shows age increases the hospitalization gradually increases. Both surveys showed all age group people were more likely to be hospitalized than reference category. The age group of 45-59 and 60+ years old persons were two to three times more likely to be hospitalized than younger (0-14 year) age group and in 60th round survey it is six to ten times more likely. Females and urban residents were less likely to be hospitalized. About 25.0 per cent females were less likely to be hospitalized than males.

Non Hindu populations were more likely to be hospitalized than Hindus. The SCs and OBCs were more likely to be hospitalized whereas STs were less likely to be hospitalized than reference category in both the surveys. Currently married couple and widow/ divorced and separated were more likely to be hospitalized 73.0 and 64.0 per cent than never married couple in 60th round whereas in 52nd round the corresponding figures were 50.0 and 35.0 per cent respectively.

Table 4.11: Odds Ratio for the hospitalization during 365 days before the survey

S.No.	Factor	52 nd round		60 th round	
		Exp (B)	Significant	Exp (B)	Significant
A.	Demographic				
1	Age Group				
	0-14 ®	--	.000	--	.000
	15-29	4.070	.000	1.278	.000
	30-44	3.977	.000	1.429	.000
	45-59	5.922	.000	2.120	.000
	60+	9.810	.000	2.871	.000
2	Sex				
	Male ®	--	--	--	--
	Female	0.738	.000	0.747	.000
3	Residence				
	Rural ®	--	--	--	--
	Urban	1.189	.000	0.993	.000
B.	Social				
1	Religion				
	Hindu ®	NA		--	.000
	Muslim	NA		1.056	.000
	Others	NA		1.373	.000
2	Social Group				
	Others ®	--	.000	--	.000
	STs	0.811	.000	0.764	.000
	SCs	1.100	.000	1.073	.000
	OBCs	NA		1.031	.000
3	Marital Status				
	Never married ®	--	.000	--	.000
	Currently married	1.502	.000	1.728	.000
	Widow/ Divorced and Separated	1.355	.000	1.639	.000
C.	Household				
1	Type of structure				
	Pucca ®	--	--	--	--
	Kutcha	1.077	.000	0.900	.000
2	Latrine				
	Latrine ®	--	--	--	--
	No latrine	0.695	.000	1.553	.000
3	Type of Drainage				
	Open ®	--	.000	--	.000
	Covered	0.851	.000	0.975	.000
	No drainage	1.310	.000	1.228	.000
4	Source of Drinking Water				

	Bottled and tap water ®	--	.000	--	.000
	Tube well and Hand pump	0.967	.000	0.961	.000
	Others	1.310	.000	1.199	.000
5	Water Treated				
	Yes ®	NA		--	--
	No	NA		0.787	.000
6.	Source of Energy for Cooking				
	Firewood and chip	NA		--	.000
	LPG	NA		0.998	.000
	Others	NA		1.027	.000
D.	Economic				
1	Education				
	Illiterate ®	--	.000	--	.000
	Up to Primary	1.304	.000	0.973	.000
	Middle and above	1.156	.000	0.950	.000
2	Activity Status				
	Labour force ®	--	--	--	--
	Not in Labour force	1.665	.000	0.663	.000
E	Region				
	North ®	--	.000	--	.000
	Central	0.699	.000	0.882	.000
	East	0.672	.000	0.954	.000
	Northeast	0.756	.000	0.665	.000
	West	1.244	.000	1.380	.000
	South	1.518	.000	1.618	.000
	Constant	0.002	.000	0.013	.000

Source: NSSO, 1998 and NSSO, 2006

NA-not available

People living in kutcha house, have no latrine facility, have covered drainage facility were less likely to be hospitalized than pucca house, have latrine facility, and have open drain household. Persons living household where there were no drainage facilities were 31.0 per cent in earlier round survey and 23.0 per cent more likely to be hospitalized in the 52nd round and 60th round respectively. Persons who have used tube well and hand pump water for drinking and were not treated before the drinking were less likely to be hospitalized than those who have used bottled and tap water and other source of drinking water, and have treated water before drink.

According to 60th round survey persons literate and in labour force less likely to be hospitalized than illiterate and not in labour force categories whereas just the opposite result was found for the 52nd round survey. There is 55.0 per cent chance of the labour force being less likely to be hospitalized during 365 days before the survey in 60th round and 66.0 per cent more likely in the 52nd round.

Persons living in South and West were more likely to be hospitalized than North Indians, whereas Central, East and Northeast Indian people were less likely to be hospitalized than North Indian in both the surveys. The odds ratios are highly significant.

The over all conclusions for odds ratio of logistic regression for ailing and hospitalization are old aged males in rural residents have a high chance of ailing and hospitalization. The Hindu, never married, people living in kutcha house and used drinking water from tube well/ hand pump without treating were less likely to be ailing in one day and 15 days before the survey and hospitalized during 365 days before the survey, in India. Southern and western people of India were most likely to be ailing and hospitalized than persons in other parts of India (table 9, 10 and 11).

Our next and final chapter is conclusions. Based on our findings we have suggested for enhancing and improving health infrastructure in that chapter.

Chapter 5

Conclusions

Chapter 5

Conclusions

There are eight millennium development goals (MDGs) to be achieved by 2015 that represent the world's main development challenges. Out of eight goals, three goals are related to health i.e., reduce child mortality, improve maternal health, and combat HIV/AIDS, malaria and other diseases. To achieve these goals proper health infrastructure is necessary. It is possible to achieve these goals if we develop our rural infrastructure. For this, Panchayati Raj Institutions (PRIs) would be play important roles. Durgaprasad and Madhuri (2004) explain the role of PRIs as the bottom line of all prosperity and health in future facilitated with focus on health into the hands of the people. The new national health policy, 2002 also recognizes the importance of PRIs in making available health services to the community (Pattanaik, 2004). The 73rd constitutional amendment has entrusted to the PRIs with 29 duties under the Schedule of the constitution. Health related duties assigned to the PRIs are- (i) health, sanitation, including hospital, primary health centers and dispensaries, (ii) family welfare and (iii) drinking water. The government of India launched National Rural Health Mission (NRHM) in April 2005 to provide effective health care to rural population.

The present study that has been conducted shows that infrastructural development in terms of setting up of clinics and hospitals is important to achieve MDGs. In the study we have used data from two surveys of NSSO's i.e., 52nd round and 60th round which were collected in 1996-97 and 2004. There are many studies carried out but, they are only village level/ district level or state level study. However, all India level study on ailing and hospitalization has not been done so far.

There are a number of factors that influence ailing and hospitalization like Demographic (age, sex, and residence), Social (religion, social group, and marital status), Household (structure, source of drinking water, water treatment, and availability of

latrine, drainage facility and source of energy for cooking), and Economic (education, activity status and landholding).

The study has two specific objectives: - to describe the population who were ailing and those who have been hospitalized and to examine the influence of various factors on ailing and hospitalization.

We have included three response variables i.e., ailing one day before the survey; ailing 15 days before the survey; and hospitalization during 365 days before the survey. The predictor variables include information of the household member such as age, sex, residence, religion, social group, marital status, house structure, source of drinking water, water treatment, drainage, latrine, source of energy for cooking, education, activity status, and landholding.

The odds ratio shows that old aged persons were more likely to be ailing one day before the survey in both rounds. Males and rural residents were more likely to be ailing. Widow/divorced and separated persons were more likely to be ailing in both rounds. It is interesting to note that earlier round survey showed that members who were living in kutcha house, and used bottled and tap water for drinking were more likely to be ailing, but the later survey showed reverse results. The household members having covered drainage, having latrine facilities and used LPG for cooking were more likely to be ailing. Higher educated persons were more ailing in earlier round whereas the later round shows illiterate were more likely to be ailing. Not in labour force persons were more likely to be ailing in both rounds. North Indian people were more likely to be ailing in earlier round whereas in later round we have found that south Indian and central Indian people were more ailing. Similar odds ratio is also found for ailing 15 days before the survey.

The logistic regression analyses for hospitalization during 365 days before the survey shows age of the persons increases the hospitalization gradually increases. As currently married and widow/ divorced and separated were more ailing in one day before the survey and 15 days before the survey. From the expected odds ratio we found that

currently married and widow/ divorced and separated were more likely to be hospitalized. The persons living in kutchha house have used treated water, having drainage and latrine facilities in the house were more ailing and as a consequence were more hospitalized.

The people from south Indian had higher percentage of ailing and hospitalization. We have analyzed the pattern of diseases and availability of health facilities in the regions. The analyses showed that in all region people were suffering from infectious and parasitic diseases, circulatory, respiratory and other diseases. But most of the south Indian people were suffering from circulatory diseases compared with other parts of Indian in both round surveys. In terms of health infrastructure (public and private hospitals) south India is in leading in position in both rounds and the worst condition is in the northeast region. In northeast region the availability of the private hospitals is less than one per cent whereas south India is 37 per cent in public and private hospital availability. In south India, the state of Kerala is leading followed by Andhra Pradesh and Tamilnadu (Given in Appendix).

In the above analyses we have considered both public and private hospitalization and treatment. Public sector health system is created, run and maintained by the central and state governments and covers national disease control programmes. Public health programmes are concerned mainly with preventive, promotive and rehabilitative aspects giving importance to primary health care. The government concentrates on basic primary health care whereas private sector covers secondary and tertiary health services. A general belief with regard to hospital usage is that most people prefer to use private hospitals even if the cost of private hospital tends to be high. Public Hospitals are not preferred due to poorer quality of their services, even though these services are provided at low cost. At the time of independence, nearly 15 per cent of the people used private facilities. In a recent study by World Bank it has been found that about 80 per cent of the people used the private hospitals in India. There were 52.0 per cent of household member hospitalized into private hospitals and in 2006 it increased by 59.0 per cent. The costs of the treatment in public and private slightly differ in rural areas in 1998 but the difference increases more than two times in 2006. It also showed that costs of treatment in private

hospitals for urban residents is not much different from public hospitals in 52nd round survey (1998) but it increases around three times more costs of treatment in private hospitals than public hospitals. The fee of hospitalization is raised with the development of new technology in field of health, improved drugs and others infrastructure.

The above does not mean that all persons are taking treatment and are satisfied with treatment. More than half of the populations (52.9 per cent) are not satisfied with medical treatment by government doctors or source of treatment/government hospitals. The required specific services are not available in the government hospitals as reported by 7.3 per cent the population. About one third of the population has not taken any treatment owing to financial reasons (32.9 per cent) and about 40.0 per cent of them said that the ailments are not considered serious by the doctors. Only 4.10 per cent reported lack of the faith in the hospital treatment. Around 42.0 per cent population had taken other measures for the recovery or relief of the ailments. The respondents were also asked as to whom they consulted for the treatment. More than one third of them (35.0 and 38.3 per cent) reported that treatment taken as self/other household member/ friends/ relatives advice and direct to medical stores (35.3 per cent). Majority of them (90.1 per cent) reported the number of times hospitalized as once during 365 days followed by two times hospitalized. They also reported that 94.8 per cent admitted in to hospitals during 16-365 days ago before the survey and only 3.6 per cent admitted 15 days before the survey. It is noted that about two per cent of the population was not yet discharged from the hospitals.

In the survey the duration of ailment is the period between the commencement of the ailment and termination of it by recovery. For ascertaining the period of ailment during the reference period, commencement will be taken as on the first day of the reference period if it was on a day beyond the reference period. Similarly, if the ailment is found to be continuing on the date of enquiry, the day of termination of the ailment will be taken as the last day of the reference period. It indicated that two per cent population's duration of hospitalization is more than 365 days. A majority of them were discharged from hospital 16-365 days before the reference period.

We have found in the analyses that old age persons, males, rural residents, Non Hindu communities, STs population, currently married and widow/divorced and separated couples were having higher chances for ailing one day and 15 days before the survey and hospitalization during 365 days before the survey. The household members living in pucca house, having latrine and covered drainage facility, used treated water for drinking, and used LPG for the cooking in house were more ailing and hospitalized. This is rather contrary to expectation. The reasons for this are not clear. Illiterate persons who were not in labour force were more ailing. South, west and central Indian people were more ailing and hospitalized than other part of Indian people.

In terms of the policy of the government it is important that due attention is paid to old age persons who are more likely to be ailing and hospitalized. We have not examined how the old age persons obtained monetary and other resources for treatment purpose. This is a separate study all together. As rural residents were more ailing and hospitalized than urban residents government should give more attention towards rural health infrastructure. Among the household factors cooking facilities emerge as important predictor of ailing and hospitalization. This may be related to over all socio-economic conditions of households. But as there is enough evidence as Sharma et al., (2004) report that indoor air pollution is a chief cause of morbidity especially for children and women. Indoor air pollution needs to be checked in houses. An advocacy programme in these respects will be helpful.

Appendix

APPENDIX

Percentage distribution of ailing and hospitalization 365 days by residence, (NSSO, 52nd)
1998 (cross tabulation)

State	Ailing one day		Ailing 15 days		Hospitalization 365	
	Rural	Urban	Rural	Urban	Rural	Urban
Andhra Pradesh	3.6	3.5	6.1	5.8	1.3	1.6
Arunachal	0.6	1.7	2.4	3.7	3.0	3.0
Assam	2.3	3.1	7.9	8.4	0.8	1.5
Bihar	1.9	1.9	3.4	4.0	0.5	1.1
Goa	2.2	1.4	4.3	2.7	2.6	2.3
Gujrat	2.5	2.0	4.5	3.5	1.3	1.9
Haryana	3.8	4.0	6.1	6.2	2.3	2.3
Himachal	5.0	2.7	8.9	6.6	2.0	1.7
J&K	2.8	2.5	5.0	5.3	1.0	0.9
Karnatka	2.6	2.2	4.2	3.7	1.2	1.6
Kerala	7.3	4.8	11.6	8.7	6.8	6.2
Madhya Pradesh	1.8	1.9	4.0	3.7	0.6	1.4
Maharashtra	3.0	2.5	5.0	4.6	1.8	2.4
Manipur	0.4	0.1	0.8	0.2	1.1	0.9
Meghalaya	0.9	1.1	3.4	3.3	1.3	2.4
Mizorum	0.5	0.2	1.8	1.1	1.8	2.5
Nagaland	2.1	2.8	3.0	4.3	1.1	1.2
Orissa	2.3	2.2	6.2	6.2	1.1	1.3
Punjab	4.1	4.8	7.5	8.4	1.3	1.7
Rajasthan	1.3	1.9	2.7	3.1	0.7	1.3
Sikkim	1.0	1.1	3.8	1.9	0.6	1.0
Tamilnadu	2.8	2.6	5.2	5.8	1.7	2.1
Tripura	4.3	5.3	11.4	9.5	3.2	3.6
U.P.	3.2	3.9	6.1	7.1	0.7	1.2
West Bengal	3.9	3.6	6.5	6.4	1.0	2.0
A &N Islands	1.0	0.3	2.7	1.5	4.2	3.4
Chandigarh	9.6	10.5	15.3	13.3	1.2	2.1
Dadra&Nagar Haveli	1.8	0.9	5.7	5.0	3.3	1.6
Daman& Diu	3.1	2.6	4.3	4.3	2.2	4.6
Delhi	1.7	2.7	2.3	4.2	1.4	1.2
Lakshdwee	3.2	0.5	5.2	4.5	4.0	5.0
Pondicherry	4.2	1.8	8.6	6.7	4.4	2.2
Total	18352723	5838715	34454125	10808594	7760059	3775742

Percent distribution of ailing and hospitalization 365 days by residence, (NSSO, 60th)
2006 (Cross Tabulation)

State	Ailing one day		Ailing 15 days		Hospitalization 365	
	Rural	Urban	Rural	Urban	Rural	Urban
J&K	4.4	5.5	7.0	8.8	1.7	2.0
Himachal	6.3	4.6	8.7	7.8	3.2	3.1
Punjab	9.3	7.2	13.7	5.9	2.9	3.0
Chandigarh	2.9	4.2	5.3	10.7	1.5	2.4
Uttranchal	2.6	5.0	5.2	7.1	1.7	1.9
Haryana	5.9	5.7	9.6	6.5	3.1	3.0
Delhi	0.9	.8	.4	8.8	.5	1.1
Rajasthan	3.7	5.5	5.7	1.6	1.6	2.4
U.P.	6.2	6.9	10.0	7.3	1.2	2.0
Bihar	2.6	3.4	5.3	10.9	1.0	1.0
Sikkim	3.6	1.3	5.5	6.3	1.5	1.6
Arunchal Pradesh	1.9	4.8	6.1	1.3	2.9	2.6
Nagaland	.9	1.8	6.2	5.1	1.3	1.5
Manipur	1.3	1.6	2.9	5.2	1.8	1.6
Mizorum	1.4	1.0	2.1	2.7	1.7	2.8
Tripura	4.6	2.8	13.0	1.7	3.9	4.6
Megalaya	3.0	2.2	5.1	7.2	.7	2.2
Assam	3.6	4.0	8.2	5.0	1.1	1.6
West Bengal	7.3	11.5	11.4	8.3	2.2	3.4
Jharkhand	.6	1.4	3.3	15.7	.9	2.1
Orissa	3.4	3.0	7.8	5.0	2.2	2.9
Chhatisgarh	3.8	3.6	7.0	5.4	1.2	2.7
M.P.	3.5	4.0	6.1	7.2	1.7	2.8
Gujrat	4.5	5.9	6.9	6.5	2.7	3.5
Daman & Diu	.9	2.1	1.9	7.8	2.4	3.4
Dadra & Nagar Haveli	.8	.9	1.5	3.5	4.8	2.8
Maharastra	5.4	8.2	9.3	2.4	2.9	3.5
Andhra Pradesh	6.4	7.5	9.0	11.9	2.1	2.8
Karnataka	3.9	4.2	6.4	11.4	2.2	2.3
Goa	11.4	5.3	13.8	5.7	3.1	3.4
Lakshadweep	8.5	8.7	11.3	9.6	5.5	7.6
Kerla	18.3	16.7	25.5	14.1	10.0	8.8
Tamilnadu	6.0	6.0	9.5	24.1	3.6	3.6
Pondicherry	11.7	14.9	14.9	9.6	6.2	4.9
A&N Island	3.7	2.1	5.1	18.6	6.1	4.5
Total	38374634	16202058	63096964	24256012	15761822	7253013

Percentage distribution of ailing and hospitalization 365 days, 1998 and 2006 (cross tabulation)

State	52 nd round (1998)			60 th round (2006)		
	Ailing one day	Ailing 15 days	Hospitalized 365 days	Ailing one day	Ailing 15 days	Hospitalized 365 days
J&K	2.7	5.1	1.0	4.6	7.1	1.7
Himachal	4.8	8.7	2.0	6.2	8.5	3.1
Punjab	4.3	7.8	1.4	8.6	12.7	2.9
Chandigarh	0.4	1.9	1.9	4.1	6.9	2.3
Uttranchal	--	--	--	3.1	5.5	1.7
Haryana	3.8	6.1	2.3	5.8	9.4	3.1
Delhi	2.7	4.1	1.2	.7	1.4	1.0
Rajsthan	1.4	2.8	0.9	4.1	6.0	1.8
U P	3.3	6.2	0.8	6.3	10.2	1.4
Bihar	1.9	3.5	0.6	2.7	5.4	1.0
Sikkim	1.0	3.6	0.6	3.3	5.0	1.5
Arunchal pradesh	0.8	2.6	3.0	2.2	6.0	2.9
Nagaland	2.3	3.4	1.2	1.2	5.9	1.4
Manipur	0.4	0.7	1.1	1.4	2.8	1.8
Mizorum	0.4	1.6	2.0	1.2	1.9	2.2
Tripura	4.4	11.2	3.3	4.3	12.2	4.0
Megalaya	0.9	3.4	1.4	2.9	5.1	.9
Assam	2.3	7.9	2.3	3.7	8.2	1.1
West bengal	3.8	6.5	1.3	8.3	12.5	2.5
Jharkhand	--	--	--	.7	3.6	1.1
Orissa	2.3	6.2	1.2	3.3	7.5	2.3
Chhatisgarh	--	--	--	3.8	7.0	1.4
M.P.	1.8	4.0	0.8	3.6	6.2	2.0
Gujrat	2.4	4.2	1.5	5.0	7.2	3.0
Daman & Diu	2.9	4.3	3.0	1.2	2.3	2.7
Dadra & Nagar Haveli	1.7	5.7	3.2	.8	1.6	4.6
Maharastra	2.8	4.9	2.0	6.6	10.4	3.2
Andhra pradesh	3.6	6.0	1.4	6.7	9.7	2.3
Karnataka	2.5	4.1	1.3	4.0	6.2	2.2
Goa	1.9	3.7	2.5	9.4	12.4	3.2
Lakshadweep	2.5	5.0	4.3	8.6	12.8	6.6
Kerla	6.7	10.9	6.7	17.9	25.1	9.7
Tamilnadu	2.7	5.4	1.8	6.0	9.5	3.6
Pondicherry	2.6	7.4	3.0	13.8	17.3	5.4
A&N Island	0.8	2.3	4.0	3.2	5.4	5.6
Total	45262721	24191439	11535797	54576691	87352970	23014832

Percentage distribution of pattern of diseases in the region, 1998 and 2006 (Cross tabulation)

S.N.	Diseases	Region (NSSO 52 nd 1998)						
		N	C	E	NE	W	S	Total
I	Infectious and parasitic diseases	9.6	18.2	18.9	21.0	12.4	9.5	13.0
II	Neoplasms	2.9	3.1	3.4	2.2	2.1	2.8	2.8
III	Endocrine, nutritional and metabolic	2.1	2.5	0.9	1.2	2.4	2.3	2.1
IV	Neuro-psychiatric disorders	4.7	3.4	2.3	2.9	2.4	4.2	3.5
V	Diseases of eye	3.0	2.5	2.4	1.1	2.7	2.5	2.6
VI	Circulatory system diseases	8.4	4.7	5.0	2.8	6.4	9.0	7.0
VII	Respiratory system diseases	7.9	7.7	6.2	5.4	6.6	7.4	7.1
VIII	Digestive system diseases	2.1	2.9	4.1	3.6	2.1	2.0	2.5
IX	Genitourinary system diseases	5.5	5.1	4.8	2.1	4.7	4.4	4.7
X	Accidents and violence	6.2	5.9	7.0	4.2	4.4	2.9	4.7
XI	Others	47.5	44.0	45.0	53.4	53.7	52.9	50.0
S.N.	Diseases	Region (NSSO 60 th 2006)						
		9.6	18.2	18.9	21.0	12.4	9.5	13.0
II	Neoplasms	2.9	3.1	3.4	2.2	2.1	2.8	2.8
III	Endocrine, nutritional and metabolic	2.1	2.5	0.9	1.2	2.4	2.3	2.1
IV	Neuro-psychiatric disorders	4.7	3.4	2.3	2.9	2.4	4.2	3.5
V	Diseases of eye	3.0	2.5	2.4	1.1	2.7	2.5	2.6
VI	Circulatory system diseases	8.4	4.7	5.0	2.8	6.4	9.0	7.0
VII	Respiratory system diseases	7.9	7.7	6.2	5.4	6.6	7.4	7.1
VIII	Digestive system diseases	2.1	2.9	4.1	3.6	2.1	2.0	2.5
IX	Genitourinary system diseases	5.5	5.1	4.8	2.1	4.7	4.4	4.7
X	Accidents and violence	6.2	5.9	7.0	4.2	4.4	2.9	4.7
XI	Others	47.5	44.0	45.0	53.4	53.7	52.9	50.0

Note: N-North, C-Central, E-East, NE-North East, W-West, S-South

The availability of the hospitals by region in India, 1998 and 2006

S.No.	Indian region	Type of hospitals (1998)			Type of hospitals (2006)		
		Public	Private	Total	Public	Private	Total
1	North	13.3	11.0	12.1	19.0	10.9	11.3
2	Central	16.7	13.2	14.9	44.4	17.2	16.6
3	East	19.5	7.6	13.4	42.8	10.2	15.9
4	Northeast	4.8	0.8	2.8	7.0	.7	2.1
5	West	15.9	23.3	19.7	34.2	23.6	19.3
6	South	29.8	44.0	37.0	52.6	37.3	34.7
	Total	6579768	6830121	13409889	9308562	13617541	22926103

Percentage distribution of diseases (Nature of Ailments) in 52nd round (1998)

Nature of ailment	Frequency	Valid Percent	Cumulative Percent
Short duration ailment			
Diarrhoea & gastroenteritis, dystentery(incl-cholera)	1340977	9.6	9.6
Tetanus	29325	.2	9.8
Diphtheria	9445	.1	9.9
Whooping cough	67929	.5	10.4
Meningitis & viral encephalitis	82029	.6	11.0
Fevers of short duration	1585922	11.4	22.4
Chicken pox	13095	.1	22.5
Measles	23819	.2	22.7
Mumps	7756	.1	22.7
Diseases of eye	156865	1.1	23.8
Acute disease of ear	26016	.2	24.0
Heart failure	208925	1.5	25.5
Cerebral stroke	46096	.3	25.9
Cough and acute bronchitis	338809	2.4	28.3
Acute respiratory infection (pneumonia)	271050	1.9	30.2
Diseases of mouth, teeth and gum	51576	.4	30.6
Injury due to accident and violence	649789	4.7	35.3
Other diagnosed ailment	977503	7.0	42.3
Other diseases	1666694	12.0	54.3
Unknown diseases	657654	4.7	59.0
Long duration ailment			
Chronic amebiasis	27525	.2	59.2
Pulmonary T.B.	336061	2.4	61.6
STDs	24583	.2	61.8
Leprosy	16227	.1	61.9
Jaundice	166217	1.2	63.1
Guinea worm	16142	.1	63.2
Filaria	11211	.1	63.3
Cancer	225478	1.6	64.9
Other tumours	165724	1.2	66.1
Anemia (general debility)	77358	.6	66.7
Goitre	41156	.3	67.0
Diabetes	141484	1.0	68.0
Beri-beri	358	.0	68.0
Ricket	13648	.1	68.1
Other malnutrition diseases	19538	.1	68.2
Mental and behavioural disorders	138893	1.0	69.2
Epilepsy	62661	.5	69.7
Other diseases of nerves	126789	.9	70.6
Cataract	44584	.3	70.9

Other visual disabilities	252152	1.8	72.7
Other disease of the eye	61115	.4	73.2
Hearing disability	3661	.0	73.2
Other diseases of the ear	21211	.2	73.3
Diseases of heart	452680	3.3	76.6
High/low blood pressure	269883	1.9	78.5
Piles	94331	.7	79.2
Speech disability	6222	.0	79.2
Diseases of mouth, teeth &gum	14146	.1	79.4
Gastritis hyper-acidity/gastric/peptic/duodenal ulcer	346873	2.5	81.8
Diseases of kidney/urinary system	438237	3.1	85.0
Prostrate disorders	16622	.1	85.1
Hydrocele	80131	.6	85.7
Pain in joints	123985	.9	86.6
Disorder of bones and joints	250464	1.8	88.4
Locomotor disability	124293	.9	89.3
Congenital deformities	27379	.2	89.5
Others disease- long duration	1277771	9.2	98.7
Unknow long duration disease	180090	1.3	99.9
Total	13915671	100.0	

Percentage distribution of diseases (Nature of Ailments) in 60th round (2006)

Nature Of Ailment	Frequency	Valid percent	Cumulative percent
Diarrhoea/dysentery	1797465	7.8	7.8
Gastritis/gastric or peptic ulcer	1050136	4.6	12.4
Worm infection	98248	.4	12.9
Amoebiosis	80193	.4	13.2
Hepatitis/joundice	403504	1.8	15.0
Heart diseases	1087092	4.7	19.7
Hypertension	510738	2.2	22.0
Resiratory including ear/nose/throat ail	682824	3.0	24.9
T.B.	538219	2.4	27.3
Bronchial asthma	640611	2.8	30.1
Disorders of joints and bones	598264	2.6	32.7
Diseases of kidney/urinary system	913444	4.0	36.7
Prostatic disorder	92326	.4	37.1
Gynaecological disordrs	1296230	5.7	42.7
Neurological disorders	690702	3.0	45.8
Psychiatric disorders	196116	.9	46.6
Conjunctivitis	49211	.2	46.8

Glaucoma	120633	.5	47.4
Cataract	688689	3.0	50.4
Diseases of skin	144285	.6	51.0
Goitre	23701	.1	51.1
Diabetes mellitus	362521	1.6	52.7
Under nutrition	16157	.1	52.8
Anaemia	223266	1.0	53.7
Sexually	28189	.1	53.8
Malaria	833276	3.6	57.5
Eruptive	57456	.3	57.7
Mumps	12650	.1	57.8
Diphtheria	54214	.2	58.0
Whooping cough	153162	.7	58.7
Fever of unknown origin	1811463	7.9	66.6
Tetanus	61765	.3	66.9
Filariasis/elephantiasis	33937	.1	67.0
Locomotor	252151	1.1	68.1
Visual incl blinds, excl-cataract	96910	.4	68.6
Speech	15397	.1	68.6
Hearing	36456	.2	68.8
Diseases of mouth/teeth/gum	60038	.3	69.0
Accident/injuries/burns/fracture s/poisoning	2374475	10.4	79.4
Cancer and other tumours	510992	2.2	81.6
Other diagnosed ailments	3842603	16.8	98.4
Other undiagnosed ailments	362419	1.6	100.0
Total	22902129	100.0	

Percentage distribution of the hospitalized persons by type of hospitals and cost of treatment by type of hospitals

Item	52 nd round		60 th round	
	Public hospitals	Private hospitals	Public hospitals	Private hospitals
Hospitalization during 365 days	48.0	52.0	41.0	59.0
Cost of treatment (Rs.)				
Rural	2080	2195	3238	7408
Urban	4300	5344	3877	11553

Particulars of spells of ailment of household members 15 days before the survey
(including hospitalization) in percent

S.No.	Item	52 nd round	60 th round
1	Whether treatment taken on medical advice	85.0	89.3
2	Whether any treatment received from Govt. Sources	81.5	32.0
3	Reason for not availing Govt. sources		
	Govt. Doctor/facility too far	19.9	12.7
	Not satisfied with medical treatment by Govt. Doctor/facility	31.2	52.9
	Long waiting	3.0	13.2
	Required specific services not available	4.7	7.3
	Others	4.1	13.8
4	Reason for no Treatment		
	No medical facility available in the neighbourhood	7.9	3.7
	Facilities available but no treatment sought owing to:		
	Lack of faith	3.9	4.1
	Long waiting	0.5	0.4
	Financial reasons	24.0	32.9
	Ailment not considered serious	52.9	39.5
	Others	10.6	19.4
5	Whether any other measure taken for recovery/relief	42.0	41.8
6	Whom consulted		
	Self/other household member/friend	35.0	38.3
	Medicine shop	36.3	35.3
	Non Medical Professional Practitioner	18.7	NA
	Others	9.8	26.4
7	Number Of Times Hospitalized		
	One	90.0	90.1
	Two	6.4	7.5
	Three and above	3.6	2.4
8	When admitted		
	During last 15 days	3.0	4.0
	16-365 ago	95.0	95.0
	More than 365 days ago	2.0	1.0
9	When discharged		
	Not yet	1.6	1.6
	During last 15 days	7.9	9.9
	16-365 days ago	90.5	88.2

NA- not available

Bibliography

Bibliography:

1. Agarwal, S., Satyavada, A., Kaushik, S., and Kumar, R. 2007. "Urbanization, urban poverty and health of the urban poor: status, challenges, and the way forward". **Demography India**. 36(1): 121-134.
2. Agarwal, Kireet., Sethi, A., Agarwal, Kamal., Kannan, A.T., Madhu, S.V. and Nair, P. 2007. "Socio-Demographic profile of Leprosy Patients in two District of Western U.P". **Journal of Communicable Diseases**. 39(1): 45-50.
3. Alam, M. 2007. "Health Security of the Aged in a Changing Demographic Scenario". In S. Prasad and C. Sathyamala (Ed) **Securing Health for All**. Institute for human development. New Delhi. 353-379.
4. Ambalavanam, V. and Madheswaran, S. 2001. "Social Protection for Urban Informal Sector Workers: Micro Evidence from Erode District, Tamil Nadu". **The Indian Journal of Labour Economics**. 44(4): 601-619.
5. Anand, K., Shah, B., Yadav, K., Singh, R., Mathur, P., Paul, E. and Kapoor, S.K. 2007. "Are the urban poor vulnerable to non-communicable diseases? In Faridabad". **The National Medical Journal of India**. 20(4):115-120.
6. Anderson, B.A., Romani, J.H., Phillips, H.E. and Zyl, J.A.V. 2002. "Environment, Access to Health Care, and Other Factors Affecting Infant and Child Survival Among the African and Coloured Populations of South Africa, 1989-94". **Population and Environment**. 23(4): 349-364.
7. Anderson, R.M. and Davidson, P.L. 1997. "Ethnicity, Aging, and Oral Health Outcomes: A conceptual framework". **Advance Dental Research**. 11(2):203-209.
8. Anonymous. 2007. "Health and Safety Back up: Asbestos Regulations get a Mixed Response". **Labour Research**. 96(2): 23.
9. Asante, A.D. and Zwi, A.B. 2007. "Public Private Partnership and Global Health Equity: Prospects and Challenges". **Indian Journal of Medical Ethics**. 4(4): 176.
10. Avasthi, A., Varma, S.C., Kulhara, P., Nehra, R., Gover, S., and Sharma, S. 2008. "Diagnosis of Common Mental Disorders by using Prime- MD Patient Health Questionnaire". **Indian Journal of Medical Research**. 127(2): 159-164
11. Babu, K.S. and holgate, S.T. 2002. "Newer Therapies for Asthma: a Focus on Anti-IgE". **The Indian Journal of Chest Diseases and Allied Sciences**. 44(2): 107-115

12. Balasubramanian, R., Ramanathan, U., Thyagarajan, K., Ramachandran, R., Rajaram, K. Bhaskar, D., Shantharam, Hariharan, R.S. and Narayanan P.R. 2007. "Evaluation of an Intermittent Six-Month Regimen in New Pulmonary Tuberculosis Patients with Diabetes Mellitus". **Indian Journal of Tuberculosis**. 54(4): 168-175.
13. Bansal, K.N., Singh, K. and Bhatnagar, S. 2001. "Prevalence of Lower RTI among Married Females in the Reproductive Age Group (15-45)". **Journal of the National Institute of Health and Family Welfare**. 24(3): 157-163.
14. Batty, David. 2008. "After the Cyclonic Storm, the Epidemic Scare". **The Hindu**, May 10: 11.
15. Black, R.E., Morris, S.S. and Bryce, K. 2003. "Where and why are 10 million children dying every year"? **The Lancet**. 361: 2226-2236.
16. Bloom, D.E., and Canning, D. 2008. "Global Demographic change: Dimensions and Economic Significance". **Population and Development Review**. 34:3-15.
17. Boardman, J.D., Finch B.K. and Hummer, R.A. 2001. "Race/Ethnic Differences in Respiratory Problems among a Nationally-Representative Cohort of Young Children in the United States". **Population Research and Policy Review** 20: 187-206.
18. Botha, M.E. 1989. "Theory Development in Perspective: The Role of Conceptual Frameworks and Models in Theory Development". **Journal of Advanced Nursing**. 14: 49-55.
19. Bruce, N., Rehfuess, E., Mehata, S., Hutton, G. and Smith K. 2006. "Indoor Air Pollution. Disease Control Priorities Project". Download from www.dcp2.org/pubs/DCP/42 on January 1, 2008.
20. Case, A., Christina, P. and Vogl, T. 2007. "Socioeconomic Status and Health in Childhood". **Social Science and Medicine**. 65: 757-761.
21. Chadha, V.K., Kumar, P., Satyanarayan, A.V.V., Chauhan, L.S., Gupta, J., Srivastava, R. Sungandhi, P. and Devi, G.V. 2007. **Indian Journal of Tuberculosis**. 54(4): 177-183.
22. Chakrabarti, A. 2007. "Prescription of Fixed Dose Combination Drugs For Diarrhoea". **Indian Journal of Medical Ethics**. 4(4): 165.
23. Chakravarty, B. 2008. "Traditional and Modern Health Care Services in Tribal Areas: Problems of Accessibility, Affordability and Acceptability". **Kurukshetra**. 56(3): 37-41.

24. Chandra, D., Guntupalli, K.K. and Guleria, R. 2007. "Hypotension is a predictor of mortality in acute exacerbations of chronic obstructive pulmonary disease". **The Indian Journal of Chest Diseases and Allied Sciences**. 49(1): 13-18.
25. Chen, L.C. and Kumar, A.K.Shiva. 2007. "Turnaround in China's Health Policies?" **Indian Journal of Human Development**. 1(1):161-162.
26. Chen, E., Martin, A.D. and Matthews, K.A. 2006. "Socioeconomic Status and Health: Do Gradients Differ Within Childhood and Adolescence". **Social Science and Medicine**.65: 2161-2170.
27. Chellan, R. and Kulkarni, P.M. 2006. "Influence of Socio-economic and demographic factors on gynaecological morbidity and treatment seeking behaviour in Northeast states of India". **Demography India**. 35(2): 303-318
28. Cochran, S.D. and Mays, V.M. 2007. "Physical Health Complaints among Lesbians, Gay Men, and Bisexual and Homosexual Experienced Heterosexual Individuals: Results from the California Quality Of Life Survey". **American Journal of Public Health**. 97(9): 2048-2055.
29. Collantes, E., Zarco, P., Munox, E., Juanola, M., Mulero, J., Fernández-Sueiro, J.L., Torre-Alonso, J.C., Gratacós, J.C., González, Batlle, E., Fernández, P., Linares, L.F., Brito, E. and Carmona, L. (2007). "Disease Pattern of Spondyloarthropathies in Spain: Description of the first National Registry". Downloaded from <http://rheumatology.oxfordjournals.org/misc/terms.shtml> on December 6, 2007.
30. CSDH Conceptual Framework. 2005. "Modeling health determinants and the pathways to inequity. Towards a Conceptual Framework for Analysis and Action on the Social determinant of Health. Commission on Social determinants of Health". Downloaded from <http://ftp.who.int/eip/commision/Cairo/Meeting/CSDHper cent20Docper cent202per cent20-20Conceptualper cent20framework> on February 15, 2008.
31. Curtis, V., and Cairn cross, S. 2003. "Effect of Washing Hands with Soap on Diarrhoea Risk in the Community: A Systematic Review". **The Lancet: Infectious Disease**.3: 275-281.
32. Das, A. 2007. "Public-Private Partnership for Providing Healthcare Services". **Indian Journal of Medical Ethics**. 4(4):174.
33. Das, S.P. 2007. "Development and Poverty in an Indian state A study of KBK districts of Orissa". **Social Change: Journal of the Council for Social Development**. 37(2): 76-98.

34. Devi, T.B. and Zamzachin, G. 2006. "Pattern of Skin Diseases in Imphal". **Indian Journal of Dermatology**. 51(2): 149-150. Downloaded from <http://www.e-ijd.org/text.asp?2006/51/2/149/26943> on December 8, 2007.
35. Dewan, R. 2001. "Health Security and Occupational Safety for Informal Migrant Workers: The Case of Bakery Industry". **The Indian Journal of Labour Economics**. 44(4): 585-599.
36. Drummond JR, Newton JP, Yemm R (1988). "Dentistry for the elderly: A review and assessment of the future". **Journal of Dentistry** 16:47-54.
37. Durgaprasad, P. and Madhuri, N.V. 2004. "Partnerships and Networking for Health Development: Initiatives, Successes and Challenges". **Kurukshetra**. 52 (3): 4-13
38. Esrey, S.A. and Habicht, H.P. 1985. "Epidemiologic Evidence for Health Benefits from Improved Water and Sanitation in Developing Countries". **Epidemiology Review**, 9: 117-127.
39. Fazenholz, P.J., Castillo, C.F.D., harris, N.S., Pelletier, A.J. and Camargo JR, C.A. 2007. "Increasing Hospital Admissions for Acute Pancreatitis, 1988-2003". **Annals of Epidemiology**. 17(7): 491-497.
40. Ghosh, S. 2005. "Does economic inequality matter in cases of infectious childhood diseases? An analysis for India". **Asia-Pacific Population Journal**. 20(1): 37-62.
41. Gift HC (1989). "Factors affecting the oral health status of older adults. National Institute of Dental Research". Downloaded from the www.adr.iadrjournals.org/cgi/content/abstract on February 25, 2008.
42. Gulati, P. and Juyal, S. 2007. "A Study of Psychosomatic Problems in Relation to Diabetes". **Disabilities and Impairments**. 21(1): 33-40.
43. Gujarati, D.N. 1995. "Basic Econometrics". New Delhi, McGraw-Hill inc.
44. Gumber, A. and Kulkarni, V. 2000. "Health Insurance for Workers in the Informal Sector". National Council of Applied Economic Research, New Delhi.
45. Gumber, A. 2007. "Health Security For Workers In The Informal Sector". In S. Prasad and C. Sathyamala (ed) **Securing Health For All**. Institute for human development. New Delhi. Pp, 304-327.
46. Gunes, S., Summer, A. P., Keles, G. C., Kara, N., Koprulu, H., Bagci, H., and Bek. Y. 2008. "Analysis of vitamin D receptor gene polymorphisms in patients with chronic periodontitis". **India Journal Medical Research**. 127(1): 58.

47. Gupta, I. And Dutta, A. 2003. "Inequities in health and health care in India: Can the Poor Hope for a Respite"? **Draft. Institute of Economic Growth. Delhi, December 2003.**
48. Gupta, H. 2008. "Creating a cancer-free world for women". **The Hindu.** June, 8:14.
49. Helman, C.G. 2007. "Culture, Health and Illness". Oxford University Press. 260-263
50. Ho, L., Bos, V., and Kunst, A.E. 2007a. "Differences in Causes of Death Patterns between the Native Dutch and Persons of Indonesian descent in the Netherlands". **American Journal of Public Health.** 97(9):1616-1617.
51. Ho, S.Y., Mak, K.K., Thomas, G.H., Schooling, M., Fielding, R., James, E.D. and Lam, T.H. 2007b. "The Relation of Chronic Cardiovascular Diseases and Diabetes Mellitus to Perceived Health and the Moderating Effects of Sex and Age". **Social Science and Medicine.**65: 1386-1396.
52. Hong, Rathavuth., Banta, James E., and Betancourt, Jose A. 2006. "Relationship between household wealth inequality and chronic childhood under-nutrition in Bangladesh". **International Journal for Equity in Health** 5:15. Downloaded from <http://www.equityhealthj.com/content/5/1/15> on May 27, 2008.
53. Hosain, G.M.Monawar, Chatterjee, N. Ara, N. and Islam, T. 2007. "Prevalence, Pattern and Determinants of Mental Disorders in Rural Bangladesh". **Indian Journal of Tuberculosis.** 54(4): 18-24.
54. ILO. 2005. "World Day for Safety and Health at Work 2005": A Background Paper.
55. ILO. 2008. "Pressures on Industrial Safety". **The Hindu,** May 23: 12.
56. Jindal, S.K. 2007. "A Health Perspective of Indoor Air Pollution". **Indian Journal of Medical Research.** 126(11): 409-411.
57. Jha, P., Chaloupka, F.J., Moore, J., Gajalakshmi, V., Gupta, P.C., Peck, Richard, Asma, S. and Zatonski, W. 2006. "Tobacco Addiction. Disease Control Priorities Project". Download from www.dcp2.org/pubs/DCP/46 on January 1, 2008.
58. Juster, H.R., Loomis, B.R., Hinman, T.M., Farrelly, M.C., Hyland, A and Bayer, V.E. 2007. "Declines in Hospital Admissions for Acute Myocardial Infection in New York State after Implementation of a Comprehensive Smoking Ban". **American Journal of Public Health.** 97(9): 2035-2039.

59. Kaulagekar, A. and Radkar, A. 2007. "Social Status makes a Difference: Tuberculosis Scenario during National Family Health Survey-2". **Indian Journal of Tuberculosis**. 54(1): 17-23.
60. Kaur, J. and Bains, K. 2006. "A Study of the Risk Factor Profile of Cardiovascular Diseases in Rural Punjabi Male Patients". **Indian Journal of Public Health**. 50 (2): 97-100.
61. Kinsella, K. and Phillip, D.R. 2005. "Global ageing: The challenge of success". **Population Bulletin**. 60(1): 11.
62. Kokiwar, P.K. and Saiprasad, g.S. 2007. "Anaemia among Adolescent Girls". **Indian Journal of Public Health**. 51(4): 252.
63. Kiviriusus, O., Huurre, T. and Ara, H. 2007. "Psychosocial Resources And Depression Among Chronically Ill Young Adults: Are Males More Vulnerable?" **Social Science and Medicine**. 65: 173-186.
64. Krishnamoorthy, E.S. 2008. "Towards equitable healthcare provision". **The Hindu**. June, 7:11.
65. Kutty, V.R. 2007. "Health in Transition in Kerala". In S. Prasad and C. Sathyamala(ed). **Securing Health for All**. Institute for Human Development. New Delhi. 123-125.
66. Mahmood, A. 1998. "Statistical Methods in Geographical Studies". New Delhi, Rajesh Publications.
67. Manoranjithan, S., Charles, H., Saravanan, B., Jayakaran, R., Abraham, S. and Jacob, K.S. 2007. "Perceptions about Suicise: A Qualitative study from Southern India". **The National Medical Journal Of India**. 20(4): 176-179.
68. Mariappan, T., Snehalatha, K.S., Vijayakumar, K.N., and Krishnamoorthy, K. 2007. "Socio-Economic Factors as Indicators of Various Risk Groups for Filariasis, Cochin, Kerala, India". **Journal of Communicable Diseases**. 39(3):197-199.
69. McKeown, T. 1979. "The Modern Rise of Population". Arnold Heinemann Publishers. New Delhi. 91-109.
70. Miller, J. 1999. "The Effects of Race/Ethnicity and Income on Early Childhood Asthma Prevalence and Health Care Use". **American Journal of Public Health** 90: 428-430.

71. Misra, S., Kantharia, S.L., and Damor, J.R. 2007. "Prevalence of goiter in 6-12 years schooling children of Panchmahal district in Gujarat, India". **Indian Journal of Medical Research**. 127(2): 475-479.
72. Moazam, S. 2007. "Pakistan was becoming a Destination for Kidney Tourism". **The Hindu**. December 9. 11.
73. Nath, D.C., Deka, A.K., and Leonetti, D.L. 2007. "Health Problems of elderly population in Assam and their correlates". **Demography India**. 36(1): 99-120.
74. National Sample Survey Organization. 2006. "Morbidity, Health Care and the Condition of the Aged". 60th Round. (Jan-June 2004) New Delhi: National Sample Survey Organization.
75. National Sample Survey Organization. 1998. "Morbidity and Treatment of Ailments". 52nd Round. (July 1995- June 1996) New Delhi: National Sample Survey Organization.
76. Nielsen, N.R., Kristensen, T.S., Zhang, Z.F., Schnohr, P. and Gronback, M. 2007. "Sociodemographic Status, Stress, and Risk of Prostate Cancer. A Prospective Cohort Study". **Annals of Epidemiology**. 17(7): 498-502.
77. Ogden, J. 1997. "Diet as a Vehicle for Self Control". In Lucy Yardley (Ed) *Material discourse of health and illness*. London, Baulledge.
78. Paris, Joel. 2002. "Chronic Suicidality among Patients with Borderline personality disorder. Psychiatric Sewrvices". 53: 738-742. Downloaded from www.psychiatricservices.psychiatryonline.org/cgi/reprint/53/6/738 on June 29, 2008.
79. Pattanaik, B.K. 2004. "Community Participation, Panchayati Raj and Rural Health Care". **Kurukshetra**. 52 (3): 14-18.
80. Peyrat, M. and Rubin, R.R. 1997. "Levels and Risks of Depression and Anxiety Symptomatology among Diabetic Adults". **Diabetes Care**. 23(9): 1443-1444.
81. Prabhjot and Sidhu, S. 2008. "Prevalence of Obesity among School going children of Amritsar. An Abstract for fifth International Symposium on Genetics, Health and Disease". **OMICS**, Feb. 17-19. GNDU Amritsar, India. 95.
82. Prasad, S. and Sathyamala, C. 2006. "Securing Health for All Dimensions and Challenges". **Institute of Human Development**, New Delhi. 12-14.
83. Prasad, R. 2008. "Incidence of Diabetes studied". **The Hindu**. February 28, 15.

84. Preston, S.H. 1975. "The Changing Relation between Mortality and level of Economic Development". **Population Studies**. 29: 231-248.
85. Pukharambam, P.D., Singh, Ng. B., Singh, L.H. and Devi, K.S. 2007. "Pattern of Hepatitis C Virus genotypes in HIV Infected patients in Imphal, Manipur". **Journal of Communicable Diseases**.39 (1): 21-24.
86. Rathore, M., Vyas, L. and Bhardwaj, A.K. 2006. "An Analysis of RTI in a Community of Rajsthan". **Journal of National Institute of Health and Family Welfare**. 29(20): 59-67.
87. Ryan, MAK., Christian, R.S., and Wohlrobe, J. 2001. "Hand Washing and Respiratory Illness among Young Adults in Military Training". **American Journal of Preventive Medicine**. 21: 79-83.
88. Rural Health Statistics in India. 2002. "Department of Family Welfare, Ministry of Health and Family Welfare". Nirman Bhavan. New Delhi.
89. Scott, B.E., Lawson, D.W. and Curtis, V. 2007. "Hard to Handle: Understanding Mothers' Hand Washing Behaviour in Ghana". **Health Policy and Planning**. 22(4): 216-224.
90. Saravanan, V. 2001. "Impact of Social Security Initiatives in Unorganized Sector: The Case of Women Beedi Workers in Rural Areas of Tamilnadu". **The Indian Journal of Labour Economics**. 44(4): 621-632.
91. Sharma, S.K., Reddy, T.S., Mohan, A., Handa, K.K., Mukhopadhyay, S. and Pande, J.N. 2002. "Sleep Disordered Breathing in Chronic Obstructive Pulmonary Disease". **The Indian Journal of Chest Diseases and Allied Sciences**. 44(2): 99-105.
92. Rutherford, D.R. and Choe, M.K. 1993. *Statistical Models for Casual Analysis*". New York, USA. John Wiley and Sons.
93. Seigal, J.S. 1980. "On the Demography of Ageing". **Demography**. 17(4): 345-364.
94. Sharma, R.C., Joshi, V., Dixit, A.K., Yadav, S., Fotedar, R. Anand, .K., Rumana, H.S. and Sharma, P.C. 2004. "Assessment of Impact of Environmental Pollution on Human Health in the City of Jodhur, Rajsthan". Download from www.icmr.nic.in/annual/2004-05/dmrc/ar45_4e.pdf on January 1, 2008.
95. Sharma, S. and Gupta, B.P. 2007. "Prevalence of RTIs/STDs Among Married Women in the Reproductive Age Group of (15-44 years) in a Rural Area of District, Sirmour (H.P.)". **Journal of Communicable Diseases**.39 (2): 133-136.

96. Sidhu, S., Malhotra, S., and Sidhu, S. 2008a. "Malnutrition and Anaemia among scheduled caste women of Amritsar (Punjab)". An Abstract for fifth International Symposium on Genetics, Health and Disease. **OMICS**, Feb. 17-19. GNDU, Amritsar, India. 95.
97. Sidhu, S. Kumari, K. Prabhjot and Sidhu, S. 2008b. Obesity: "An emerging Public health problem in Punjab". An Abstract for fifth International Symposium on Genetics, Health and Disease. **OMICS**, Feb. 17-19. GNDU Amritsar, India. 95.
98. Sinha, S. 2007. "Health Status And Health Care Among Tribals": The Case of Jharkhand. In S. Prasad and C. Sathyamala (ed) **Securing Health For All**. Institute for Human Development. New Delhi. 380-398.
99. Smith, K.V. and Goldman, N. 2007. "Socioeconomic Differences in Health among older Adults in Mexico". **Social Science and Medicine**.65:1372-1385.
100. Smith, J.B., Lakhey, B., Thapa, S., Bhandari, S.R. and Neupane, S. 1996. "Maternal Morbidity Among Women Admitted for Delivery at a Public Hospital in Kathmandu". **Journal of Indian Medical Association**. 34:132-140.
101. Speizer, F. E., Horton, S., Batt, J. and Slutsky, A.S. 2006. "Respiratory Diseases of Adults". Disease Control Priorities Project. Download from www.dcp2.org/pubs/DCP/35 on January 1, 2008.
102. Srivastava, A. 1999. "Health Status of India's Population": A State level Analysis. M.Phil. Dissertation, CSR/SSS/ JNU, New Delhi.
103. Stamatakis, K.A., Kaplan, G.A., and Roberts, R.E. 2007. "Short Sleep Duration across Income, Education and Race/Ethnic Groups": Population prevalence and growing disparities during 34 years of follow-up. **Annals of Epidemiology**. 17(12): 948-955.
104. Sudarshan, R. and Kaur, R. 1999. "The Tobacco Industry and Women's Employment": Old Concerns and New Imperatives. **The Indian Journal of Labour Economics**. 42(4): 675-685.
105. Sushama, P.N. 1990. "Social context of health behaviour in Kerala". In J. Caldwell, S. Findley, P. Caldwell, G. Santow, W. Cosford, J. Braod and D.B. Freeman (ed.). **Health Transition: The Cultural, Social And Behavioural Determinants of Health**. Vol.II 777-787.
106. Susser, M., Watson, W. and Hopper, K. 1985. **Sociology in Medicine**. Oxf. Uni. Press. New York. 16-17.

107. Swain, P., Meitei, M.H. and Raj, T.P.S. 2004. "Morbidity Status of Widows in India". **Journal of National Institute of Health and Family Welfare**. 27 (3): 173-184.
108. Uma, H.R. 2004. "Financing of Health Services in India under Five Year Plans". **Kurukshetra**.52 (3): 19-21.
109. Verma, S., Rai, S.K., Kant, S., and Chaudhary, K. 2007. "Morbidity of Paediatric inpatients at Community Health Centre at a near District Hospital in Northern India". **Indian Journal of Public Health**. 51 (2):125-126.
110. World Health Organization. 2007. "International Classification of Diseases". 10th Round. Downloaded from www.who.int on November 10, 2007.
111. Youwang, Y., Jianming, D., Yong, X. and Pong, Z. 1992. "Epidemiological Features of an Outbreak of Diphtheria and Its Control with Diphtheria Toxoid Immunization". **International Journal of Epidemiology**. 21(3): 807-811.
112. Williams, W., Hageman, A., Calhoun, B., and Johnson, S. 1997. "Factors Associated with Hospitalization and Inpatient Length of Stay in a University based HIV clinical program". Downloaded from www.gateway.nlm.nih.gov/meetingabstracts/ma on June 28, 2008.
113. Woolnough, Roisin. 2007. "Mental Health: Fighting the Fear Factor". **Labour Research**. 96(2): 15-16.