8

Chapter Summary of Findings, Conclusions and Suggestions

8.1 Background, the problem and objectives

Research on healthcare services has become wide spread a topic of interest among the anthropologists, demographers, medical professionals, policy makers, social scientists and economists. It is also considered as one of the facet of social study because various social factors directly or indirectly influence the sick person in his different stages of sickness and treatment process. Economic theories and policies can be applied to a broad spectrum of healthcare issues both at individual (micro) and population (macro) levels. Health economics has emerged as a new sub discipline of economics which deals with allocation of health resources, demand for and supply of healthcare services, micro-economic and macro-economic healthcare evaluations, market equilibrium for healthcare services, planning, budgeting and monitoring of healthcare services etc. Thus, to make a proper planning of the delivery of healthcare services for the individual level and community level, study of both theoretical and practical areas of healthcare economics become important.

Development affects health in a complex way. It is evidenced that, on the one hand, pattern of economic development affects health status of the people, but on the other hand, level of health status of the people affects economic development. It has long been proved that economic development remains a far cry without human development of the country and human development is only possible when everybody enjoys good health. Because, good health status of the people of any country helps in creating the quality of human capital and thereby improves the economic development of the country.

Health status of the people of any region is generally measured by morbidity, mortality and disability rates. However, mortality indicators are considered as good proxy for overall health

status of the people, but it cannot be presumed to be completely reliable in measuring health status in many developing countries including India, where majority of deaths occur at home, and so accurate information on cause-specific and age-specific mortality are scarce. Moreover, autopsy is done only in some special cases such as accidental death, murder, suicide and others, which is also not trustworthy in all cases. Thus, the study of morbidity can be considered as an alternative indicator for evaluating the burden of disease or health status of the people of these countries. Here, burden of disease refers to the impact of morbidity or health problem or health disorder on the people of any region.

Thus, health disorder, in other words, burden of disease at the individual level or at population level of any geographical region can be understood by analysing the epidemiological profile or morbidity pattern of the people of that particular region. This epidemiological profile or morbidity pattern or burden of disease varies between the countries, within the country, between the different regions and between different socio-economic and demographic groups etc. However, this morbidity pattern or burden of disease of the people may affect the health seeking behaviour or utilisation of healthcare facilities. In India, utilisation of healthcare facilities continues to be low and varies significantly across the states and regions. Utilisation for public healthcare facilities is considerably higher among the low income groups of the society than the others both in rural and urban areas of the country. Despite higher costs, private sector has emerged as the leading source of both institutional and non-institutional healthcare delivery services. On the other hand, it is said that ensuring good health to everybody at affordable cost is one of the important goals of the every government of any country. But, in many developing countries including India, government finance in healthcare sectors is very less or limited, which compels lower income groups to seek healthcare facilities from private sources which comprise of high cost of medicines, diagnostic tests, medical equipment etc. resulting into high out-of-pocket healthcare expenditure and (OOPHE) greater financial burden on them. Economists are also concerned with the impact of increasing costs of healthcare services imposed on patient, patient's family and relatives, the local community, as well as on the other agencies.

It is often argued that the distribution healthcare services should be based on 'need' rather than on individual demand should be based on 'medical need', not on the 'economic status' of the patient. In addition, demand for healthcare services is a derived demand, as good health is demanded, so proper healthcare services are demanded. Further, health of the individual

depreciates every day, so he or she needs to increase the consumption or utilisation of healthcare services to maintain the same health status all over the time. Thus, demand for good health and demand for healthcare services are interrelated. However, to get the true picture of burden of disease, health seeking behaviour and out-of-pocket healthcare expenditure incurred by the people of any region, it is imperative to study the epidemiological, demographic and socio-economic characteristics of the people of that region. Present research work was carried out in Siliguri Municipal Corporation Area (SMCA) which spreads over the jurisdiction of two districts such as plain area of Darjeeling district and north-western part of Jalpaiguri district of West Bengal State. SMCA consists of 47 wards with around 115,191 normal households and with 41.90 sq. km. total land area as of census 2011. Out of total 47 municipal wards, 33 wards covering 20.11 sq. km. are under the jurisdiction of Darjeeling district, while 14 wards with 21.79 sq. km. are under the jurisdiction of Jalpaiguri district. SMCA is surrounded by the sub-Himalayan ranges of Darjeeling district on the north; by Bangladesh, Uttar Dinajpur and Bihar on the south; by Jalpaiguri district on the east, and by neighbouring country Nepal on the west. According to 2011 census, total population of SMCA is 5,13,264 ; of which male population is 2,63,218 and female population is 2,49,562. However, the actual pressure of population upon SMCA may be higher than what is estimated from various census reports.

In addition, the area is characterised by rapid population growth, cosmopolitan culture, frequent population movement, surrounding tea gardens, strategic location for business and communication with the north-eastern part of the country including Sikkim and the bordering nations such as Nepal, Bhutan and Bangladesh etc. Due to the rapid development and attraction of the urban infrastructure of the city many people from the surrounding areas come for job in informal sectors, petty trading, hawking etc. This has resulted into an increase in urban slums in and around SMCA. Census, 2011 reveals that there are26, 619 slum households with population 122, 958, which constitute about 23.96 percent of the total population of the city. These lead to an inevitable shortage of water supply, sanitation, excessive pressure on housing and other facilities including healthcare services in the city. But, there is no any structural guideline of healthcare institution as exits in the rural areas of the country under the aegis of National Rural Health Mission (NRHM). Moreover, National Urban Health Mission (NUHM) was not implemented during the study. However, one district hospital in SMCA and one medical college and hospital in its adjoining area play vital role in delivering public health facilities to the people

living in the study area. In addition, existing public healthcare infrastructure is not capable of meeting the growing needs of healthcare facilities of the people. Besides these, a large number of patients are referred to district hospital and medical college from other healthcare institutions of surrounding rural and hill areas due to lack of infrastructure. Further, though tea gardens in its adjoining area have their exclusive healthcare facilities, they also directly or indirectly depend on the city for treatment. This makes the public and other healthcare facilities of city over burdened and thereby reduce the quality of healthcare service delivery and increase the risk of morbidity in the concerned study area.

The study was conducted with the broad objectives such as : i) to examine the epidemiological profile of people revealing incidence and prevalence rates of illness and disability in SMCA, (ii) to study the pattern of utilisation of healthcare facilities according to source of care (public, private or else), type of visit (IPD or OPD) and system of medicine, (iii) to examine the impact of burden of disease on utilisation of healthcare services considering the demographic and socio-economic characteristics of the people of SMCA, (iv) to study the out-of -pocket (OOPHE) healthcare expenditure and other related costs borne by the households, (v) to examine the impact of burden of disease on out-of–pocket healthcare expenditure with preference of care and other dimensions of health seeking behaviour of people living in the study area.

8.2 Present Study

The present study used the cross-sectional household survey method to meet the broad objectives of research. The information from the households were collected through the pre-designed, pre-tested, structured schedule comprising of some open-ended and some close-ended questions. Here, a household is considered as a group of family members or individuals who live in the same house and who share the common benefits or arrangements like toilet, housing area, source of drinking water, utensils etc. Field survey was conducted for three months (i.e. during March - May, 2014). Interview was carried out with the head of the family or with his wife or with any interested member who has the knowledge of every member of that family in their first language. Females were interviewed regarding the type of disease, severity of disease, number of disease episodes experienced by the each individual family members, duration of the disease, cleanliness, sanitation etc. Males were interviewed, specially, regarding the utilisation pattern of

healthcare services for different disease episodes of each family member, healthcare expenditures incurred on each family member during the reference period.

A multi-stage sampling method was used for the present study. In the first stage, following a simple systematic random sampling technique, 14 wards of SMCA out of total 33 wards falling under the Darjeeling district jurisdiction and 6 wards of SMCA from total of 14 wards falling under the Jalpaiguri district jurisdiction were obtained. Thus, a total of 20 wards from the total of 47 wards of SMCA were selected for the study. In the second stage, probability proportion to population size (PPS) method was applied to calculate the sampling unit from the each selected ward of SMCA. However, by applying standard formula of determining sample size in prevalence study, required minimum sample size for Darjeeling district area was 898 persons (or 238 households) and for Jalpaiguri district area was 675 persons (or 162 households). But, through the survey, total 1684 persons (i.e. 1033 persons from Darjeeling district area and 651 persons from Jalpaiguri district area) were obtained. Thus, analysis is based on sample size of 1684 persons or 400 households of SMCA spreading over different selected wards.

Further, in order to get systematic and comprehensive analysis of burden of disease of the households in terms of morbidity, sampled data on different illness episodes were grouped under three broad categories such as Group I, Group II and Group III according to the modalities of Global Burden of Disease (GBD) 2010 study as recommend by World Health Organization (WHO). Group I represents the disease such as communicable, maternal, peri-natal conditions and nutritional deficiency; Group II represents the all major non-communicable disease and Group III represents intentional and unintentional injuries including accidents. The study primarily considered the self-perceived morbidity based on the perception or reporting of symptoms and impairments by individual, and to some extent, disease names as told by the physicians or the medical store sales persons after hearing the symptoms from the sick person, not on official medical records or clinically diagnosed. In addition, the measurement of incidence and prevalence rates of disease of the people during the reference period of twelve months was done applying the standard formula as recommended by Expert committee on Health Statistics of the World Health Organisation (WHO). When a person visits any type of healthcare services with more than one symptom or illness, the disease which is more severe or the main health disorder for which the person sought medical care was included in the study and choice of care

for more severe disease was considered. Further, for single illness episode all responses were recorded.

The study defined utilisation of healthcare facilities in three ways: a) Utilisation of healthcare facilities from 'modern source' where opinions or advices are taken from doctors and medical experts by one group , and utilisation of healthcare facilities from 'traditional source' where treatment is sought from paramedical staff including personnel in chemist's shop, family treatment , or by self-medication or and from any systems of medicine (including ayurveda, yoga, unani and others), except allopathy and homeopathy; b) Utilisation of healthcare facilities from 'public', 'private' or other institutions (including NGOs and charitable organisations); c) Utilisation of healthcare facilities from 'allopathy', 'homeopathy', or 'other' systems of medicine. Therefore, utilisation is the visit of any healthcare facilities by a person during reference the period of twelve months (i.e. one year) and utilisation rate refers to the number of times the total population use healthcare facilities during reference the period. Moreover, the study calculated the total out-of-pocket healthcare expenditure (OOPHE) by summing up the payments made by the households for all the sick members of the family on different components of healthcare expenditure (i.e. public hospital card/ registration fees, doctors'/consultation fees, diagnostic test charges, medicine costs, hospital or nursing home charges including surgery not covered by any health insurance benefits, special diets taken as per the advice by the doctors, transportation cost incurred to visit the health facilities including ambulance fares, other miscellaneous expenditure such as tips, rituals, helper costs, food taken outside etc.) during the reference period of one year.

Finally, two separate models were developed using econometric approaches to measure the impact of disease burden on utilisation of healthcare services and on OOPHE of the households in SMCA. First model, i.e. logistic regression model, which provided the explanation of how pattern of healthcare service utilisation or health seeking behaviour of the individuals changes with respect to change in different components of the burden of disease such as category of disease, severity of disease, nature of disease considering their demographic, socio-economic and disease characteristics in the study area. On the other hand, second model, i.e. log linear model in log-log form was developed to measure the impact of different variables associated with the burden of disease on out-of-pocket healthcare expenditure incurred by the people of SMCA through the process of utilisation of healthcare services.

8.3 Epidemiological Profile

The descriptive statistics reveal that there are total 696 illness episodes in SMCA, out of which 428 episodes are from Darjeeling district area and 268 episodes are from Jalpaiguri district area. Out of 428 cases in Darjeeling district area, 19.16 percent are of communicable and maternal related disease (GI), about 60 percent are of non-communicable disease (GII) and more than 20 percent are of intentional and unintentional injury including accidents (GIII) episodes. On the other hand, in Jalpaiguri district area, percentage of GI, GII and GII category episodes are 35.82, 50.0 and 14.18 respectively. The results indicate that Communicable, maternal, peri-natal and nutritional conditions are more in Jalpaiguri district area, but cases of non-communicable disease and intentional and unintentional injury and accident episodes are more in Darjeeling district area. However, for SMCA as a whole, out of total illness episodes, 25.6 percent are of communicable and maternal related disease (GI), 56.3 percent are of non-communicable disease (GII) and 18.1 percent are of intentional and unintentional injury including accidents (GIII) episodes. On the other hand, it is worked out that morbidity prevalence rate per 1000 persons of SMCA for GI, GII and GIII category illness episodes are 105.70, 232.78 and 74.82 respectively. Thus, it can be concluded that morbidity pattern of Siliguri Municipal Corporation Area(SMCA) is dominated by the non-communicable disease; still a considerable number of people are exposed to a greater risk of being affected by communicable, maternal and peri-natal related disease, followed by intentional and unintentional injuries including accidents, indicating the region is moving towards advanced phase of epidemiological transition.

Results show that morbidity incidence rate and morbidity prevalence rate of SMCA are worked out to be 258.91 per 1000 persons and 413.30 per 1000 persons respectively. Morbidity prevalence rate is higher than morbidity incidence rate, because of the reason that former category considers only the new cases of disease, but the latter includes both the previously existing disease cases and the new cases during the reference period. Further, females reported higher morbidity incidence rate (i.e. 278.78 per 1000 persons) as well as higher morbidity prevalence rate (i.e. 429.96 per 1000 persons) than the male counterparts. Morbidity prevalence

rate for chronic disease (i.e. 284.44 per 1000 persons) is much higher than that of for acute disease (i.e. 128.86 per 1000 persons), higher prevalence of non-communicable disease among the people could be one of the probable reasons for this. Result also highlights that out of total 110 disability cases in SMCA, 7 (i.e. 6.36 percent) are of physically challenged by birth, 38 (i.e. 34.55 percent) are of functionally disabled, 1 (i.e. 0.91 percent) is of mentally challenged, 58 (i.e. 52.73 percent) are of temporarily disabled and 6 (i.e. 5.45 percent) are of other types of disability such as hearing impaired, very low eye sight etc. It conveys that, a considerable number of people of SMCA are suffering from different types of disabilities including functional disability.

Further, study indicates gender disparity with regard to morbidity prevalence. Morbidity prevalence rate for female is. 429.96 per 1000 persons and that of for male is400.83 per 1000 persons. This may be due to the high education level among females, more reporting to the health facilities for pregnancy complications and child birth and others. Though there is no such difference in morbidity prevalence among the different castes, but considerable difference is found among the different religions. Food habit, typical religious beliefs, living condition, life styles, occupation, genetically transmitted disease and others may be the probable reasons for this. Low prevalence rate of infectious or communicable disease among the educated people is observed and this may be due to more awareness, consciousness, early perception, knowledge, hygienic living and others. Higher morbidity prevalence rate among low income groups may be due to the fact that they ignore the minor health problems and rarely report to the doctor or other health facilities because of their low capacity to meet medical expenses or low affordability, unable to predict future consequences, no seriousness with disease, fail to manage time etc. In addition, nutritional deficiency, poor housing, sanitation, low awareness, unhygienic living etc. could be the higher prevalence rate for GI category disease among BPL families. On the contrary, sedentary life style, overweight, hypertension, over reporting to the healthcare facilities due to high affordability etc., may be the reasons for higher prevalence for GII category disease among APL families. Finally, small sized households can pay more attention on each member, have comparatively higher per capita income, more consciousness etc. than the other counterpart, so former category can perceive the disease at early stage and report to the healthcare facilities immediately and thus might have reported lower morbidity than the large sized families.

8.4 Health Seeking Behaviour or Utilisation of Healthcare Services

Healthcare seeking behaviour of the individual or household can better be understood by the pattern of utilisation of healthcare services which is indicated by several factors such as type of healthcare facility, type of visit, type of sources of healthcare facility and system of medicine utilised by the sick people during the reference period. Study reveals that for 638 illness episodes (i.e. 91.67 percent) of total 696 illness episodes utilised healthcare facility and for rest of 58 illness episodes (i.e. 8.33 percent) patients did not contact any healthcare service during the reference period of twelve months (i.e. one year) in SMCA. Thus, analysis of healthcare utilisation services or health seeking behaviour of the people was done on the basis of 638 illness episodes. Further, it is worked that, for SMCA as a whole, morbidity prevalence rate per 1000 persons is 413.3 and healthcare service utilisation rate per 1000 persons is378.86, indicating all illness episodes were not utilised healthcare services. Low socio-economic background, low severity disease, ignorance, lack of perception and perceived risk etc. of the households could be the possible reasons for non-utilisation of healthcare facilities. Further, results indicate that majority of the visits in healthcare institutions were for non-hospitalisation cases or OPD services (i.e. 89.34 percent) and rest were for inpatient stay or IPD facility or hospitalisation cases (i.e. 10.66 percent).

The study also clearly points out the existence of gender gap regarding the utilisation of healthcare services among the people of SMCA. On the one hand, morbidity prevalence rate for females (i.e.429.96 per 1000 persons) is comparatively higher than for males (i.e.400.83 per 1000 persons), although utilisation of healthcare services for males (i.e. 92.75 percent) is comparatively higher than that of for females (i.e. 90.32 percent). Ignorance, lack of perception of future risk, sacrifice or compromise for the family, economic factors, accepting as natural event of life, thinking as destiny of life, high tolerance level, perceiving low severity etc. could be the reason for low utilisation by the females.

Taking utmost care for small children and perceived risk could be probable reason for high utilisation of healthcare facility (i.e. 97.14 percent), by the children below 5 years old, on the other side, highly aged people are physically or economically dependent on other members of the

family, therefore, visiting healthcare institution during the illness episodes by themselves is quite impossible, this could lead to low utilisation of healthcare facility (i.e. 81.58 percent) by them. Higher utilisation of healthcare services among the post graduates (i.e. 100 percent) indicates their high perception, awareness and consciousness about health, avoiding perceived risks and uncertainties etc. As it is known that small-sized households can pay more attention on each member and generally have comparatively higher per capita income, more consciousness etc. than the large-sized households, thus reporting to the healthcare facilities by former groups (i.e. 93.27 percent) is comparatively higher than the other counterparts (i.e. 86.34 percent).

Modern type of healthcare facilities were utilised for majority (i.e. 85.4 percent) of all three category illness episodes, where as traditional type of healthcare was followed for comparatively small number of illness episodes (i.e. 14.6 percent).Further, for SMCA as a whole, utilisation of both the public and private source of healthcare services increases as the severity of disease changes from low to high via medium severity of disease, indicating that choice of source of healthcare services varies with the change in severity of disease of the sick person. It is also clear from the study that private healthcare facilities were mostly utilised, followed by public healthcare services, buying medicines from chemists' shop and other sources available in the study area. Further, use of public healthcare services was more for curing communicable, maternal, peri-natal and nutritional conditions, followed by injuries and accidents and non-communicable disease. It may be due to the availability of community medicine for communicable disease at free of costs at public health facilities, availability of emergency service, relatively higher utilisation by low income groups, particularly, for maternal and peri-natal conditions and long duration high severe disease etc.

The study also reveals that allopathy system of medicine was preferred for all severity of disease episodes for quick relief, easy availability, and proper diagnosis process etc. though it is relatively costlier than other system of medicines for low income groups. In addition, combination of any two or more systems of medicine was practiced mainly sick persons not satisfied with the system of medicine they were following , when severity was low homeopathy and other systems of medicines were followed, but the same sick persons started accepting allopathy system of medicine when disease become high severe.

8.5 Out-of-pocket Healthcare Expenditure

Impact of different health disorders on out-of-pocket healthcare expenditure (OOPHE) incurred by the people was also the part of the research. Study expectedly reveals that maximum OOPHE was made on meeting hospital or nursing home bills (i.e. 32.97 percent). Beside hospitalisation charges, expenditure on medicine (i.e. 30.55 percent) constituted major part of OOPHE, followed by doctor/ physician fees (i.e. 12.70 percent), payments for diagnostic tests (i.e. 11.74 percent), other miscellaneous expenditure (i.e. 5.47 percent), transportation costs (i.e. 3.97 percent) and special diet costs (i.e. 2.60 percent).

It is worked out that average annual OOPHE for GI , GII and GIII category of disease are Rs. 6466.04 (i.e. 18.2 percent of total OOPHE), Rs. 10397.04 (i.e. 56.7 percent of total OOPHE) and Rs. 6040.90 (i.e. 25.1 percent of total OOPHE) respectively. It clearly indicates that major part of annual healthcare expenditure was incurred on curing GII category illnesses, followed by GIII category illnesses and GI category illnesses. On the other hand, study reveals that when severity of disease is low, average annual OOPHE is worked out to be Rs. 4014.10, but when the disease turns out to be highly severe, the same expenditure reaches to Rs. 14779.76, indicating direct relation relationship between severity of disease and average annual OOPHE spending. Further, it is worked out that, while annual average healthcare expenditure for curing acute disease was Rs. 7809.70 (i.e. 29 percent of total OOPHE), average annual OOPHE on the on treatment of chronic disease was Rs. 7809.70 (i.e. 71 percent of total OOPHE), indicating that as nature of disease changes healthcare expenditure of the people also changes. Treatment of chronic disease continues for long duration, it may be the reason of higher OOPHE for chronic disease than acute disease.

Study also finds that average annual OOPHE for following allopathy, ayurveda and others, homeopathy, yoga and combination of any two or more system of medicines are Rs. 9875.02(i.e. 83 percent of total OOPHE), Rs. 4223.64 (i.e. 2 percent of total OOPHE), Rs. 830.00(i.e.0.8 percent of total OOPHE), Rs. 2662.00 (about 1 percent of total OOPHE) and Rs. 4457.33 (i.e. 5 percent of total OOPHE) respectively. It indicates that percentage of healthcare expenditure to the total OOPHE is highest for following allopathy system of medicine, followed by use of combination of any two or more systems of medicine, ayurveda and allied, and other system of medicines. It is, further, worked out that average annual OOPHE incurred by the

people for receiving treatment from private healthcare institution is Rs. 10686.50, from public sources is Rs. 4053.29, from NGOs or charitable organisations is Rs. 1807.60, for purchasing medicines from chemist's shop is Rs. 1707.32, for adopting self-medication or home therapy is Rs. 657.41 per disease episode during the reference period of one year. Thus, it clearly indicates that average annual OOPHE is much higher at private healthcare facilities than the other sources of care people utilised during their illness episodes. On the other hand, while average annual OOPHE per illness episode for inpatient care (IPD services) is Rs. 37551.90, same for outpatient visits or OPD services is Rs. 4492.31, conveying hospitalisation or inpatient care is very expensive phenomenon in SMCA.

8.6 Impact of Disease Burden on Utilisation of Healthcare Facilities

Econometric analysis of the health seeking behaviour of the people is done by developing five different logistic regression models, with respect to (1) utilisation of all types of healthcare facilities, (2) utilisation of healthcare facilities from modern care in contrast to traditional care, (3) utilisation of IPD services in contrast to OPD services, and (4) utilisation of allopathy and ayurveda systems of medicine in contrast to homeopathy medicine, and (5) utilisation of public and private healthcare facilities in contrast to other sources of care. In the first three cases, binary multivariate logistic regression model and in the last two cases, multinomial logit regression model were applied to estimate the parameters affecting the utilisation of healthcare services.

In the first two models, utilisation of healthcare services is the dependent variable and explanatory variables are gender, age, education level, religion, caste, marital status, family size, monthly household income, economic class of household, category of disease, severity of disease and nature of disease. On the other hand, only three variables which are directly associated with the burden of disease such as category of disease, severity of disease and nature of disease are considered as explanatory variables in last three models.

In the first model, explanatory variables such as age, religion, marital status, monthly household income, nature of disease of the people are significant at 1 percent level; gender and non-communicable disease (i.e. GII category disease) are significant at 5 percent level and

family size is significant at 10 percent level. Results show that probability of utilising healthcare facilities by males is about 2 times more than females, which is significant at 5 per cent level. However, utilisation by Hindu is 5.5 times greater than the other counterpart and utilisation by currently married is 3 times more than non-currently married. Further, results indicate that as age of the sick people increases, likelihood of utilisation decreases. In addition, household characteristics reveal that as family size and monthly family income increase, households are more likely to utilise the healthcare services compared to respective reference categories. Further, utilisation increases by 3.1 times for GII category diseases, as compared with reference category of GIII category cases and odds ratio of utilisation of healthcare services increases by 9.1 times for chronic diseases compared to acute diseases, indicating that category of disease and nature of disease suffered by the people has significant impact on utilisation of healthcare facilities in SMCA.

In the second model (i.e. utilisation of healthcare facilities from modern care in contrast to traditional care), explanatory variables such as religion, monthly household income, economic class of household, non-communicable disease (i.e. GII category disease), high severe disease of the people are significant at 1 percent level; age, Higher secondary to Graduate qualified person, age, communicable disease (i.e. GI category disease), medium severe disease, nature of disease are significant at 5 percent level and caste of the sick people (general and OBC) is significant at 10 percent level. Model provides significant results for the variables which are directly associated with the burden of disease such as category of disease, severity of disease and nature of disease. Results regarding category of disease reveal that probability of utilising modern care increases by 2.3 times for GI category diseases and by 4.8 times for GII category diseases respectively, when compared with GIII category diseases. On the other hand, probability of utilising modern care is abruptly high (i.e. approximately 35 times) when a person experiences high severe disease, compared to the reference category of low severe disease. Finally, result shows that likelihood of using modern care for chronic diseases is 2.3 times greater than for acute diseases, implying that probability of utilisation of modern care for long duration disease is much higher than short duration diseases.

In the third model, the log odds of utilising IPD services in contrast to OPD services by the people of SMCA is shown. Results show that highly severe disease is significant at 1 percent level, communicable disease (i.e. GI category disease) is significant at 5 percent level and

medium severe disease is significant at 10 percent level. The model shows the impact of disease on hospitalisation episodes irrespective of background characteristics of the sick people. Result reveals that probability of getting hospitalised is more for GIII category diseases than for GI category diseases. Further, results show that as severity of disease changes from low to medium, probability of being hospitalised increases by approximately 1.9 times and similar changes from low to high resulted into an increase in odds ratio by 3.6 times.

In the fourth model, the results of multinomial logistic regression in the form of odds ratio of utilising allopathy and ayurveda etc. systems of medicine in contrast to homeopathy reveal that the probability of following allopathy system of medicine in contrast to homeopathy for GI category diseases increases by 2.778 times and for GII category diseases increases by 1.954, compared to GIII category. But in contrast to homeopathy medicine, likelihood of adopting ayurveda and others (such as physiotherapy, yoga, unani etc.) system is quite higher for GI and GII category diseases. However, as severity of disease increases, probability of treating with allopathy as well as with ayurveda and others increases indicating that category of disease and severity of disease have considerable effect on different systems of medicine among the people of SMCA.

The fifth model demonstrates probability of using public and private cares in contrast to other sources available in SMCA. Results show that low severe disease is significant at 1 percent level and medium severe disease is significant at 5 percent level for utilising public sources of care. On the other hand, both low severe disease and medium severe disease are significant at 1 percent level and nature of disease is significant at 5 percent level for utilising private sources of care. Econometric findings reveal that in contrast to other sources, probability of using both public and private healthcare services increase as the severity of disease changes from low to medium. However, when the nature of disease changes from acute to chronic (i.e. from short duration to long duration), probability of utilising private healthcare services increases by2.087 times implying that in contrast to other sources, likelihood of using private healthcare services is much higher for chronic diseases than for acute diseases. Therefore, it can be concluded from all five models that burden of disease of the people has significant impact on utilisation of healthcare services in SMCA.

8.7 Impact of Disease Burden on out-of-pocket healthcare expenditure

A log linear multivariate regression model in log-log form was developed to capture the effect of different dimensions of disease burden and health seeking behaviour on healthcare expenditure made by the people from their own financial resources, considering log of out-of-pocket healthcare expenditure (OOPHE) incurred by the people of SMCA. Econometric results reveal that explanatory variables such as number of days suffered, severity of disease, pattern of utilisation, sources of care, system of medicine, type of care (or nature of utilisation), affordability of the household, place of residence and age of the sick person have emerged out statistically significant at normal level of test of significance, indicating that a change in the all these predictor variables lead to a change in OOPHE incurred by the people during the reference period of one year. Further, positive coefficient of significant variables such as number of days suffered, severity of disease, pattern of utilisation, nature of utilisation, affordability of the household and age of the sick person indicates that when number of days of suffering increases, severity of disease increases, use of the modern method of treatment increases, hospitalisation case increases, affordability of the households increases and age of the sick person increases, OOPHE also increases. On the other hand, negative coefficient of the significant variables, such as sources of care, system of medicine and place of residence of the sick person indicates that as the sick person moves from private care to other sources of care, from allopathy treatment to other alternative system of medicine OOPHE decreases. It may be due to the fact that treatment at private institutions is costlier than the other sources, allopathy system of medicine is expensive than the other alternative system of medicine. On the other hand, decrease in OOPHE in Jalpaiguri district area may be explained by the fact that socio-economic conditions of the people living in that area is not as good as compared to the people living in Darjeeling district area.

Since the estimated econometric model is specified in log-log form, the estimated coefficients can be considered as elasticities of OOPHE with respect to explanatory variables of interest. The estimated OOPHE elasticity with respect to number of days suffered is 0.532, severity of disease is 0.978, pattern of utilisation is 0.423, type of care is 2.270, system of medicine is -0.271, sources of care is -0.372, affordability of household is 0.451, place of residence is -0.335 and age of the sick person is 0.332 respectively. However, same results can be interpreted that a 10 percent increase in number of days of suffering severity of disease, pattern of utilisation, affordability of household and age of the sick person lead to an increase in

OOPHE by5.3 percent, 9.8 percent, 4.2 percent, 22 percent and 3.3 percent respectively. On the other hand, 10 percent change in system of medicine from allopathy to other systems leads to a decrease in OOPHE by 2.7 percent. Similarly, when source of healthcare services changes by 10 percent from private care to others care, OOPHE decreases by 3.7 percent, but when place of residence of the sick person changes from Darjeeling district area to Jalpaiguri district area, possibility of incurring OOPHE decreases by 3.3 percent. Comparing all these elasticities, it is clear from the results that OOPHE elasticity with respect to type of care is larger than any of the other elasticities. It suggests the view that type of care is more important to explain the variations in OOPHE in SMCA. It is probably because of as nature of healthcare utilisation or type of care changes from OPD to IPD, healthcare expenditure increases by manifolds, as latter type is much more expensive phenomenon than the former category. Therefore, the present study concludes that burden of disease has significant impact on utilisation of healthcare services as well as on out-of- pocket healthcare expenditure incurred by the people of Siliguri Municipal Corporation Area.

8.7 General Inferences

The study was commenced to seek the answers of some basic questions in the study area. However, following inferences can be drawn from the analysis of epidemiological profile, health seeking behaviour and out-of pocket-healthcare expenditure incurred by the people of Siliguri Municipal Corporation Area. The study finds that percentage of communicable, maternal, peri-natal conditions and nutritional deficiency cases are more in Jalpaiguri district area and percentage of non-communicable diseases and intentional and unintentional injury episodes are more in Darjeeling district area. But, morbidity pattern of the people of Siliguri Municipal Corporation Area (SMCA) is dominated by the non-communicable diseases; still a considerable number of people are exposed to a greater risk of being affected by communicable, maternal and peri-natal conditions, followed by injuries including accidents, indicating the region is moving towards the advanced phase of epidemiological transition. Further, morbidity prevalence rate for chronic diseases is much higher than that of for acute diseases in SMCA. However, present study

reveals that demographic and socio-economic characteristics of the people also have significant influence on the epidemiological profile of the people in the region. Different morbidity prevalence rate is found between male and female. Though there is no such remarkable difference in morbidity prevalence among the different castes, but considerable difference is found among the different religions. Morbidity prevalence also varies as age, educational attainment, marital status and occupational status of the sick person etc. varies as well in the region. Both morbidity prevalence rate and morbidity incidence rate for females are much higher than for male counterparts. In addition, study finds that around 6.5 percent of people are experiencing different types of disability such as physically challenged by birth, mentally challenged and other types of disability like hearing impaired, very low eye sight etc. Along with these, considerable number of functional disability cases due to old age, injuries and wounds due to fall, accidents etc. were observed in the region.

However, all the illness episodes were not utilised the healthcare services by the sick people, despite availability of healthcare facilities at reachable distance. Study finds that while morbidity prevalence rate per 1000 persons is 413.30, healthcare facility utilisation rate per 1000 persons is 378.86and non-utilisation rate per 1000 persons is 34.44. Further, study reveals that demographic and socio-economic background of the people play vital role in utilising the available healthcare services. Study also confirms the existence of gender gap in utilising the healthcare services though educational attainment of the female is quite good. On the other hand, while healthcare service utilisation rate for small children is high, utilisation rate is low for highly aged persons. Variation in utilisation pattern exists among the different educational levels, marital status, religion, economic status, size of the family. More specifically, disease burden affects the health seeking behaviour of the people in the concerned area. Modern type of healthcare facilities is mainly utilised for majority of all three categories of illness episodes experienced by the people of SMCA. Traditional pattern is also popular for the treatment of bone fracture and other related problems. People mostly prefer allopathy system of medicine, followed by homeopathy, ayurveda and other alternative systems of medicine for all types of illness.

It is seen that private healthcare facilities are mostly utilised, followed by public healthcare services, buying medicines from chemists' shop and other sources available in SMCA. But, public healthcare services are used for curing communicable, maternal, peri-natal conditions and nutritional deficiency, followed by injuries and accidents and non-communicable diseases.

Utilisation of traditional healthcare services is comparatively higher for acute diseases than for chronic diseases.

Study reveals that, on an average, household spends Rupees 8618.23 per illness episode on healthcare facilities from their own pockets annually. Expenditure on medicine constitutes major part of OOPHE, followed by doctor/ physician fees, payments for diagnostic tests, other miscellaneous expenditure, transportation costs and special diet costs.

Major part of healthcare expenditure was incurred on curing non-communicable diseases, followed by wounds and injuries and communicable, maternal, peri-natal and nutritional deficiency diseases. Healthcare expenditure also varies as severity of disease changes, while severity disease changes from low to high, average annual OOPHE increases by more than three times. On the other hand, study finds remarkable difference in healthcare expenditure between acute diseases and chronic diseases. However, study finds direct relation between number of days of suffering and OOPHE.

The study finds that pattern of healthcare utilisation, sources of care and choice of system of medicine are significant bearing on treatment costs or healthcare expenditure. It is highest for following allopathy system of medicine, followed by homeopathy, combination of any two or more systems of medicine and others etc. Both average and total annual OOPHE are much higher in private healthcare facilities than the other sources of care available. Hospitalisation or inpatient stay at private nursing home is high-priced issue in SMCA. Study also reveals that as majority of the illness episodes utilised the modern method of treatment following allopathy system of medicine, so out-of- pocket healthcare expenditure incurred by the households is relatively higher in the study area.

8.8 Policy Recommendations

- It is evident from the study that though morbidity pattern of the people of Siliguri Municipal Corporation Area (SMCA) is dominated by the non-communicable diseases, a large number of people experienced injuries including major road accidents, considering this fact the policy makers should prepare a plan of opening up of trauma relief center in

the existing healthcare institutions or setting up of new institution in the area and to fulfill the demand.

- The people of SMCA living under the jurisdiction of Jalpaiguri district area are experiencing comparatively more communicable, maternal, peri-natal and nutritional deficiency diseases than the other counterpart. The concerned authority should make a comprehensive plan so that living standard of the low socio-economic groups of this area can be improved. Health awareness camp, particularly, focusing on maintenance of hygienic and cleanliness living may be organised on regular interval in association with other educational institutions, social welfare organisations and NGOs working in the area.
- Females reported higher morbidity incidence rate and higher morbidity prevalence rate, but probability of utilising healthcare facilities by them is less than males. Appropriate policy, particularly, for the female such as awareness campaign, mobile health checkup clinic, borough wise health meet fortnightly or monthly etc. must be undertaken to improve the health status of the women and to increase the healthcare service utilisation.
- The study reveals that as age of the sick people increases, probability of utilising healthcare services decreases. Policy should be framed to increase the healthcare service utilisation rate for all age groups, specially, for the aged people as they are more vulnerable to different types of diseases.
- Likelihood of utilising modern healthcare services is seen to be increased as the level of education of the people increases. So, proper planning is needed to spread the education among all the sections of the society, more specifically, among the slum dwellers and low socio-economic groups living in and around the city so that habit of utilising healthcare services increases among all sections of the society.
- Probability of utilising modern care is seen to have increased for non-communicable diseases than for communicable and other peri-natal and maternal conditions. Appropriate policy should be adopted to make the modern care available and accessible to the people at the affordable price for treatment of all types of diseases.
- Utilisation of traditional healthcare practices or primitive treatment process is more popular for the treatment of bone fracture related problems. Appropriate measures should

be adopted by the service providers so that faith on modern healthcare services is enhanced.

- Likelihood of using modern care for chronic disease (long duration) is seen to be much greater than for acute disease (short duration). Strong policy should be brought up in the system to control the price of the medicine and other associated components of treatment so that modern healthcare facility gets available at affordable price for all types of diseases. Further, more number of fair price medicine shop, generic medicine shop or similar types may be initiated by the local authority in association with the other agencies in the area.
- It is also seen that probability of hospitalisation is more for accidents and injury cases than for communicable and non-communicable diseases. So special arrangement must be there in the healthcare institutions to cater better quality healthcare services to the affected people.
- Probability of receiving of ayurveda system of medicine is seen to be high. Policy makers may think of setting up separate ayurveda treatment center under the ministry of AYUSH to fulfill the need of the people.
- Probability of utilising public healthcare services is relatively lower for non-communicable and high severe diseases. Keeping in mind the affordability of the low income groups, public healthcare institutions should be upgraded with modern equipment, techniques and facilities so that confidence of the people towards the public healthcare institution is enhanced.
- Possibility of incurring out-of-pocket healthcare expenditure is seen to be lower for female. To remove this gender biasness, encouragement of women empowerment, awareness campaign etc. may be initiated by bringing out the suitable policy for them.
- Out-of-pocket healthcare expenditure is seen to be abruptly high at private healthcare institutions. To make the healthcare facility available and accessible for all the sections of the society, appropriate policy should be framed out so that private players can be regulated and controlled.
- Cost of allopathy system of medicine is seen to be much higher than the other alternative systems of medicine. Policy makers should rationalise the fact and take necessary steps to

make other alternative systems of medicine available at affordable price as their demand is rising among the people.

- Coefficient of out-of-pocket healthcare expenditure for the sick people living in Jalpaiguri district area is negative. Rationalising the fact, policy makers should formulate a comprehensive plan so that socio-economic status of the people living in that area is improved and capability of meeting healthcare expenditure is increased.
- Coefficient of elasticity of incurring out-of-pocket healthcare expenditure is extremely high for hospitalisation cases as it is costly phenomenon. Health insurance and other medical benefits may be encouraged for all section of the society by the initiative of local government or other concerned agencies.

8.9 Conclusion

Epidemiologic transition theory states that during the phase of modernisation or urbanisation of the society, pattern of morbidity and causes of mortality are changed, whereby acute infectious diseases are gradually displaced by chronic non-communicable, degenerative, man-made diseases and injuries. Finally, society experiences emergence and re-emergence of both old and new infectious and parasitic diseases which turns out to be the leading cause of morbidity and mortality. However, Siliguri Municipal Corporation Area is said to be the one of the fastest growing city in the country experiencing rapid urbanisation, pace of economic development and increasing slum. This lead to environmental degradation, changing lifestyle and food habits, inevitable shortage of water supply, sanitation, housing and other facilities including healthcare services in the city. Present study reveals that epidemiological or morbidity profile of the people of this region is characterised by dominance of non-communicable diseases, followed by communicable, maternal and peri-natal conditions and nutritional deficiency diseases injuries and wounds including accidents. But, recent outbreak of dengue and other viral influenza in Siliguri and its adjoining area is an example of emergence or re-emergence of infectious and parasitic diseases right at hand. Thus, it can be commented that Siliguri Municipal Corporation Area is moving towards advanced stage of epidemiological transition. But existing public, private and other healthcare facilities are overburdened and particularly, public healthcare infrastructure is not capable of meeting the growing needs for healthcare facilities and thereby

reduces the health service quality and increases the risk of mortality and morbidity of the people living in this area. However, all illness episodes were not utilised the existing healthcare facilities, socio-economic and cultural differences are found responsible for this. A comprehensive policy is required, particularly, for the up liftmen of low socio-economic groups so that gap between morbidity rate and healthcare service utilisation rate can be minimised. Existing public healthcare institutions should be more strengthened so that all people including economically disadvantaged groups can avail all the benefits at a minimum cost. Further, to deal with the growing needs of the people for healthcare facilities, new public healthcare institutions with modern equipment and better facilities needs to be set up in and around the city. As the events of road accident are rising continuously in and around the city, special arrangements must be there in the existing healthcare institutions. However, keeping in the mind the recent emergence of dengue and other viral influenza, public healthcare infrastructure should be well equipped with physical as well as human resources to tackle the emerging problems. More number of maternity home, child healthcare center, fair price medicine shop or generic medicine shop should be opened up by the local government with the help of other agencies. To boost up the confidence towards the public healthcare institutions, special mechanism needs to be developed so that quality of care and hygiene is maintained there. Hospitalisation at private healthcare institution is costly phenomenon in the city and it becomes very difficult for the low income groups to receive quality of care from there. Besides medicine, diagnostic charge is high priced issue in the area. Non- utilisation of healthcare services or discontinuation of treatment process occurred by the low income groups due to high price of diagnostic tests and all the major diagnostic centers are purely controlled by the private players and there is good nexus between the health professionals and diagnostic centers. There should be some regulatory body to control them and deliver the services at a justified price. Time has come to thinking of setting up of diagnostic center by the initiative of public health authority to protect the interest of the economically disadvantaged groups in the region. Moreover, private healthcare institutions are needed to be regulated and controlled by strong and strict laws to protect the interest of the people. To tackle the high healthcare expenditure at private healthcare institutions, health insurance scheme or other similar type of benefits may be offered by the initiative of public authority. Rationalising the growing interest of the people towards the alternative system of medicine, particularly, for ayurveda and yoga, it is need of the hour to think of setting up of

ayurveda healthcare and yoga center under the initiative of state or central government in and around the city. Finally, considering the situation, there is a call for special attention of the policy makers, demographers, scientific communities and health professionals to make the healthcare services accessible, affordable to all the people living in the region, which will help improve the health status and reduce productivity loss, reduce healthcare burden on families as well as on government. The study supports the views that healthcare services should be distributed on the basis of ‘medical need’, not on the ‘economic status’.