Child Health Care System in North East India with Special Reference to Sikkim

Dissertation Submitted to Sikkim University in Partial Fulfillment

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Submitted by:

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Date:

Declaration

I declare that the thesis entitled "**Child Health Care System in North East India with Special Reference to Sikkim''** submitted to Department of Economics, Sikkim University for the degree of Master of Philosophy. The research work brings to the light the results of an original investigation made by me and it is authentic in nature. The thesis is work of my own and has not been submitted for any other degree of this University or any other University.

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This is to certify that the thesis entitled **"Child Heath Care System in North East India with Special Reference to Sikkim''** submitted to Department of Economics, Sikkim University in partial fulfillment of the requirements for the degree of **Master of Philosophy in Economics**, embodies the result of bona fide research work carried out by **Miss Sumitra Gurung** under my guidance and supervision. She has fulfilled the requirements relating to the nature, period of research and presentation of seminar talk etc.

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"Child Health Care System in North East India with Special Reference to Sikkim''

Submitted by **Miss Sumitra Gurung** under the supervision of Dr. **Ruma Kundu** of the Department of Economics, School of Social Science, Sikkim University, Gangtok – 737102, India.

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Date: **- Sumitra Gurung**

Place: Gangtok

Contents

Abbreviations

ANC	:	Antenatal checkup
ASHA	:	Accredited Social Health Association
BCG	:	Bacillus Chalmette Vaccine
BOC	:	Birth Order of Child
BFC	:	Breast Feeding of Child
CAGR	:	Compound Annual Growth Rate
CDR	:	Crude Death Rate
CBR	:	Crude Birth Rate
CPHA	:	Canadian Public Health Association
CHCs	:	Community health centre's
DPT	:	Diphtheria Pertussis Tetanus
DT	:	Diphtheria and Tetanus Toxoids
DH	:	District hospital
DIST	:	Distance
EMM	:	Exposure to Mass Media
(GOI)	:	Government of India
HC	:	Health Card
ICDS	:	Integrated Child Development Schemes
IMR	:	Infant Mortality Rate
IMMU	:	Immunization
LER	:	Life Expectancy Rate
LOC	:	Location

MMR	:	Maternal Mortality Rate
MA	:	Mother Age
ME	:	Mother Education
MWS	:	Mother Working Status
MEH	:	Monthly Expenditure on Health
NER	:	North Eastern Region
NFHS	:	National Family Health Survey
NDDCP	:	National Diarrhoeal Disease Control Programme
NNMB	:	National Nutrition Monitoring Bureau
OPV	:	Oral Polio Vaccine
PHCs	:	Primary health centre's
PCI	:	Per Capita Income
RCH	:	Reproductive and Child Health
RNA	:	Number of room available
REL	:	Religion
STNM	:	Sir Tashi Namgyal Memorial Hospital
SC	:	Sub centers
TT	:	Tetanus Toxoid
TFM	:	Total Family Member
TWM	:	Total Working Member
WOC	:	Weight of Child
WIC	:	Woman, Infant and Child

Chapter - 1

Introduction

1.1. Introduction

The term child health refers the physical, mental, emotional, spiritual, and social well being of the children. Since the Alma Ata declaration in 1978, health organisations all over the world have been more vigilant and have been diligently working towards attaining a good health for all. As child health is most endangered, especially among the poorer sections of society in the developing countries, the bulk of such attempts are directed towards children.

Concept of Child Health

The concept of child health is viewed differently by different authors. In order to develop a universally acceptable definition, the two components in child health viz., “child’’ and “health” need to be discussed separately.

The Webster’s dictionary of English language, (1997) states that the word child refers to “A son or daughter specially of an age of either infancy or youth". But they have not mentioned the age of either infancy or youth, according to Robinson and Walgreen, (1997) the span of childhood has been measured by them as the period from “birth to 12 years of age’’. In a meaning given by Nancy in (1983), the concept for the child is given as the duration “from the day of birth to the 14^{th} birthday’’. Similarly Marlow, (1994) and Susan K. Samuel (1996) stated that the Childhood period is from birth to the preadolescent stage and that the preadolescent age may exist anywhere between 11 to 13 years.

Coming to the term “Health’’, it is derived from the old English word “hoelth”, which means a state of being sound and generally assumes a soundness of the body . According to Stafen (1966), health is an absence of sickness both physically and mentally. Health is viewed differently by different Researchers or authors all over the world.

According to the World Health organisation WHO in (1948) "Child health" is defined as a state of complete physical, mental, intellectual, social and emotional well-being and not merely the absence of disease or infirmity".[1] (Health Workgroup, First Things First, October 2007). Healthy children live in families, environments and communities that provide them with the opportunity to reach their fullest development potential. Keeping this approach in mind the health of a child needs to be considered in a broader perspective. So the evaluation of the healthcare status of the child requires special attention. As the First Five Year Plan in India stated, "Health is a positive state of well being in which harmonious development of mental and physical capacities of the individual lead to the enjoyment of a rich and full life"[2]. It shows that lack of health whether physical, mental or emotional is a bad sign for the nation while also being harmful for the children. Poor health condition also deprives children from school attendance. Thus the quality of children life depends on the implementation of the child development scheme as well as proper dissemination of information to the parents in different regions. Child health and its consequent issues are increasing in importance in the developing countries but it is also a fact that the protection of child health and prevention of diseases has been implemented very poorly. Thus good health is a combination of physical, mental and social well-being of the nation. The expert committee of the Indian Council for Medical Research (ICMR) and the Indian Council for Social Science Research (ICSSR) referred to this fact in their report "Health for all by 2000 A.D." In a wider sense, health is defined in terms of adaptation to change in nature and society. Health plays a very important role in human life as it determines the well being of the family as well as the nation.

Health and human capital also play a vital role in economic growth because economic development is the process of raising the output level of an economy which is totally depends on the physical and human capital. Physical capital is assigned a crucial importance in economic growth whereas human capital is considered to be a long term factor of production. Human physical capabilities have received the significant attention in the recent times as a means of enriching intangible capital. Thus the improvement of

[1] World health organization in (1948.)
[2] First five year plan (1951-56).

health status has a major role in the enhancement of human capabilities (Sen 1987). In economic terms human resource development can be described as accumulation of human capital and its effectiveness towards the growth of the economy. It has been truly considered that health is not everything, but everything else is nothing without health. With the advancement in the field of knowledge and technology during the 21st century medicine as a field has become more complex, while the treatment has become correspondingly more costly. However the benefits or uses of modern medicine have not yet spread uniformly, creating a gap between rural and urban areas, and between rich and poor. Hence based on ideas given by many researchers on child health it may be concluded that an absence of any disease or infirmity connected with physical, mental, spiritual, and social well being can be regarded as health and that the individual struggle for its protection and renovation.

After considering the studies on child and health separately, it is time to understand the concept of child health. Kher (1972) has explained the concept of child health as "total health of the child from infant to preadolescent period''. Similarly Park (1995) was of the opinion that child health is the "promotive, preventive, curative and rehabilitative care for children''. Thus according to the experts, child health in conclusion regarded as the physical, emotional, spiritual, mental and social well-being, achieved through promotive, curative, and rehabilitative care for the children from birth to the 13th year of life.

1.2. Child Health - A Global Perspective

Public effort for child health was introduced in the early seventeen century. Since then, the American and European societies have placed greater focus on child health (Friedlander, 1988). The World Health Organisation and the UNICEF have played a very important role in promoting good health for all children.

The health sector in India has been neglected. Since Independence only 0.04% of GDP has been invested in the health sector. In the Eleventh Five Year Plan (2007-2012) only 65% i.e. 75, 533 crores out of the total budgeted expenditure of 1, 23, 9001 crores has

been spent on the health sector. It shows the failure of the Government to utilise the fund in an efficient manner for the proper development of the health sector.

However, even after six decades of planned development in India, the status of its healthcare sector is quite unsatisfactory. Although India has achieved unparalleled economic growth in the post-reforms decades (Saikia 2012), it has performed poorly in terms of health sector development (Baru et.al. 2010). India has been lagging behind other developing countries like China, Sri Lanka and Bangladesh in terms of the state of healthcare infrastructure as well as many health indicators like life expectancy at birth, infant mortality and under five mortality rates etc. (Government of India 2005). As per the National Health Policy (2002) only 24 per cent villages in India have healthcare facilities as against 88 per cent towns and only 34 per cent medical professionals are in rural areas as against 66 percent in urban areas. Bhandari and Dutta (2007) observe that while about 70 percent of India's population live in rural areas, only 20 percent of hospital beds are located in rural areas.

Improvement in health indicators is influenced by the following factors: (a) medical involvement on health (b) health promoting factors like water, sanitation and hygiene (c) social and economic factors. Most of the analysis shows that the second and third factors have a greater impact on health.

1.3.Child Health in India

The present study has chosen the states of the region to gain a deeper understanding of issues related to the child health. Child health status can be determined by looking at the rates of morbidity and mortality of the children. It can also be understood by looking at the coverage of immunisation, nutritional status and the healthcare infrastructure facility. In 1977 India started a major health program which was changed into a family welfare programme with maternal and child health becoming a fundamental part of the family planning programme, with the vision of reduction in birth rate which has a direct relationship with reduction in infant and child mortality. Similarly India has started a diarrhoea disease control programme in 1978. The Universal

Immunisation program (UIP) was taken up in 1986 and it was started in all districts of the country during 1989-90. UIP become a part of the Child Survival and Safe Motherhood (CSSM) Programme in 1992 and Reproductive and Child Health (RCH) Programme in 1997. Bose (1998) reported that the Madras was the first state to set up maternal and child clinics in 1931.By the year 1938, there were 800 maternal and child welfare clinics functioning in India, providing services for pregnant mothers and children.

Child healthcare in pre independence period in India has to give a more attention with the recognition of international children care by the Government of India, placing a more emphasis on the need for children to grow healthy (paul, 1995). In 1943 the Government of India organised a committee under the chairmanship of Bhore, which gives a more attention to both mother as well as children to protect them from vulnerable disease because of that causes the morbidity and mortality rates are high among this groups (chalkley, 1987). Since independence the health services, organisation, infrastructure and programme related with child health have been extensively changed in the first two decades through the contribution of various committees like the Modaliar committee (1962), the Jalianwala committee (1967), and the Srivastava committee (1975) etc. similarly A National Health Policy has been introduced by the Government of India in 1983, with the objective of attaining the goal of "Health for All by 2000 AD'' by providing an effective and efficient healthcare system for all individuals throughout the nation, specially the vulnerable groups like women, children and the under privileged.

Child health and its consequent issues are increasing in importance in the developing countries but the protection and prevention has been implemented very poorly. As the First Five Year Plan in India stated, "Health is a positive state of well being in which harmonious development of mental and physical capacities of the individual lead to the enjoyment of a rich and full life"[3]. It suggests that lack of health whether physical, mental or emotional is a bad sign for the nation while also being harmful for the children. Poor health condition also deprives them from school attendance. Thus the quality of children's life depends on the implementation of the child development scheme as well as proper dissemination of information to parents in different regions.

[3] First five year plan (1951-56).

As per the National Health Policy 2002 only 24 per cent villages in India have healthcare facilities as against 88 per cent of the towns. Only 34 per cent of the medical professionals are in rural areas as against 66 percent in urban areas. Bhandari and Dutta (2007) observe that while about 70 percent of India's population live in rural areas, only 20 percent of hospital beds are located in rural areas.

In the demographic context children in India account for (378.2) million and (37.7%) of the total population as per the National Family Health Survey (2005 to 2006). There is a decline trend in child population from 1971 viz. 42% to 39.6 % in 1981 and to 36 % in 1991. But during the last few decades i.e. 2000 show a minor improvement in child population, even though there is a decline in overall percentage of the child population.

Table 1.1 Child Population in India

Year	Children (in millions)	Percentage of total population
1971	230.2	42.00
1981	270.9	39.60
1991	297.7	36.00
2001	378.2	36.76
2011	372.4	30.7

Source: National Family Health Survey, 2005-2006.

The above table shows that children of India in numbering 378.2 million account for 36 % of the total population as per the National Family Health Survey, (2000-2001). This represents a moderate increase in total population. Even though there is decline in overall child population from the previous year we can see from table 1.1 the child population is constantly growing in terms of sheer numbers. The child population is 230.2 million in 1971 grew to 270.9 million by 1981. It further increased to 297 million in 1991and to 378 million in 2000 respectively. However there was a fall in child population to 158 million in 2011.

Table 1.2. Number of Health Centers in NER (Census 2011)

States	PHC	CHCs	Sub-centers
Arunachal Pradesh	97	48	286
Assam	938	108	4604
Manipur	80	16	420
Meghalaya	109	29	405
Mizoram	57	9	370
Nagaland	126	21	396
Sikkim	24	2	146
Tripura	79	11	632
India	148129	23887	4809

Source: Rural health statistics in India (2011).

As per the 2011 census, the total population of the north-east region accounted for 3.1 percent of the population of India while the population of children aged less than six years was reported to be 2.8 percent out of this population. Using the figures of Census 2001 the decline was sharper for female children compared to male children in the age group of 0-6 years. According to NFHS-3 states like Sikkim, Mizoram and Manipur have the lowest proportion of underweight children i.e. 20-22% as compared to other north-east states, and are ahead of states like Kerala, Punjab and Goa. Meghalaya reveals a very high proportion of underweight children comparable to states in east or central India. On the other hand, Arunachal Pradesh, Assam and Tripura has a 30-40% of the children are underweight. It also reveal that in the north-east region, more children in the U-5 group are suffering from chronic malnutrition (36-55%), than from acute malnutrition (9-31%).This means that child malnutrition among the U-5 age group in the north-east region pertains more to stunting (short for their age) than wasting (thin for their height).Therefore the above picture reveals that the condition of child health is not in a good position throughout the north-east region. In total there are 7402 sub-centers,

991 primary health centers, 178 community health centers and 615 allopathic hospitals in the north-east excluding Sikkim.

1.4. The health care scenario in Sikkim

Sikkim is one of the most beautiful and peaceful states in India. It is a small, remote, mountainous and landlocked state and lies in the North-Eastern region of India with an area of about 7,096 square kilometers. It lies in the eastern Himalayas at an altitude 300 meters to more than 8000 meters. The average maximum temperature is 28 degree C and minimum 13 degree C in summer while in winter it is 18 to 5 degree C. Sikkim is the 22nd state of India; it merged with the Indian union in 16th may, 1975. There is only one major government hospital at Gangtok viz. the Sir Tashi Namgyal Memorial hospital (STNM) established in 1917 with 50 beds and 3 doctors. There has been significant progress in health standards over the last 15 years.

Sikkim comprises of four districts viz. North, East, West and South. It has a total population of 607,688 as per the (census 2011), It has a total of 9 sub-divisions, 176 gram Panchayat units, 31 administrative block centers, 986 Panchayat wards and 7 municipal corporations/nagar Panchayat consisting of 47 municipality wards/nagar Panchayat. Sikkim did relatively well in achieving most of the national norms set under the "Health for all by 2000" scheme of the central Government after it signed the Alma Ata Declaration in 1978, as the results of improved healthcare are partially shown by the birth and death rates in the state. Sikkim stood in a good position with regard to death and birth rates as compared to the other north eastern regions. By 2003 the birth rate had gone down by 21.9 % as against 24.8% nationally while the death rate had also gone down by 5.0 % against the national value of 8.0%. The state level hospital is located at Gangtok in East district of the state. There are 24 primary health centers (PHCs) in the state. The East district comprises of 8 primary health centers (PHCs) as it has the highest population, followed by the West district with 7 PHCs, South with 6 and North with 3 PHCs; there are also 147 primary health sub-centers out of which 33% are located in the East district, 28% in West, 27% in South and 13% in North, respectively.

The East district has higher pressure of in terms of handling population per health facility as compared to the other districts. Districts hospitals and PHCs of the East district cover 2.45 lakh population followed by South, West and North with 1.31 lakh, 1.23 lakh and 0.41 lakh respectively. Because of the overcrowding effect of population in the East district people are unable to get proper medical facilities, especially in the rural areas. According to the Labor Bureau Report on Employment and Unemployment Survey (2013-14), Sikkim has the highest unemployment rate (more than 15 percent) among the Indian states. It indicates that Sikkim has not been able to escape from the vicious cycle of poverty and malnutrition. Unemployment indicates the high level of the poverty line and or no income generation. This situation leads to the upholding of causes of child health because of the sustained increase in poverty rate.

Table 1.3. District wise No. of health institution in Sikkim (census2011)

Districts	DH	Sub Divisional Hosp.	CHC	PHC	SC
East Sikkim	1	0	1	6	48
West Sikkim	1	0	0	7	41
North Sikkim	1	0	0	5	19
South Sikkim	1	0	1	6	39

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

Note: District hospital (DH), Sub-Divisional hospital (SDH), Community health centre

There have been many studies on health but the present study focuses on a micro level effort whose primary objective is the provision the minimum public healthcare facilities in rural areas. Primary healthcare infrastructure developments in rural area basically consist of a three tier system viz., sub-centers, primary health centers, and community health centers.

1.5. Health Profile of the children in North-East region in general and Sikkim in particular

The health profile of the child depends on especial health care services whether in north - east region or in Sikkim, health status of the children largely dependent on the status of the mother, socio-economic status, education, awareness level, health practices during pregnancy, periodical immunisation of the child, fertility records, antenatal care etc. The present study is based on the relevant information will be collected from the parents (especially mother) of the child with the help of structured questionnaire designed for the purpose. Some of the studies on health status of mother contributed by the Rao, et.al, and ministry of health and family welfare in (1995) show that age, family size, as well as type of family, relation with family, etc will have an effect on the mother's health status.

Antenatal care

Antenatal care refers to the care given to the pregnant women so that they have a safe pregnancy and healthy baby. Pregnancy is a normal physiological process associated with certain risks to the health of the mother and the infant she bears. These risks can be overcome through proper antenatal care. Data for the 1990s and 2000-2001 shows that just over 70 % of women through the world have at least one antenatal care visit with a skilled provider during pregnancy. In the industrialised countries, coverage is extremely high with 98% of women having at least one visit whereas in developing world antenatal care use is around 68%. This indicates considerable success for programme aimed at making antenatal care available.

Antenatal care (ANC) strategies are intended for pregnant women in order to screen and detect early signs of risk factors for diseases followed by timely intervention, originally with the aspiration of reducing maternal and prenatal mortality and morbidity. The acknowledged benefit of antenatal care to the baby in terms of growth, risk of infection, and survival however, remains the justification of the benefits to the mother has now shifted to emphasizing the promotion of health and health-seeking behavior, including birth preparedness.

Disease and disorder during pregnancy

Organisms causing diphtheria, influenza, typhoid, tetanus, and chicken pox can pass on the infection to the foetus. This is critical in determining the degree of effects on the development of the foetus. Therefore, before the women conceive she should have been immunised against measles. The pregnant mother should be immunised against tetanus also as this is a major cause of mortality among mothers and infants.

Another disorder that can occur during pregnancy is toxemia. In its mild from it is characterised by high blood pressure, rapid and excessive weight gain and retention of fluid in the tissues. If the condition is controlled at this stage there is no danger to the fetus. If it continues to progress, it can led to convulsion and even coma which can cause death of the mother and the fetus. If the baby is born, her development in all areas will be seriously affected.

Nutrition

The mother's body is also undergoing changes during pregnancy and she needs extra calories, protein, vitamins, and minerals. Hence the expectant mother needs more food. Certain minerals and vitamins are required in greater quantities as compared to others. These include calcium, iron and B-complex vitamins. The quality of the diet is as important as its quantity. To ensure that the mother gets a nutritive diet, care should be taken to include fruits, green vegetables, pulses, milk and its products. Mothers who have a good diet pregnancy during enjoy better health and fewer disorders. If the mother is healthy, the chances of delivering a premature baby are low. Children born of mothers who have a good diet have a better health, a higher resistance to infection and fewer chances of contracting of colds, pneumonia and tetanus. Mother who has a poor diet may have infants with low birth weight. This can have adverse effects on the child's physical and mental development.

Benefit of breast feeding

Breast milk contains antibodies and others substances that help babies fight off infections. The iron in breast milk is present in a form that is a very easy for babies to absorb. Certain chemicals in breast milk may be important for optimal brain development of an infant. A number of scientific studies have shown that on the whole, breastfed babies are a little smarter than formula-fed ones. It may be that breast milk itself improves brain development, or it may be that the women who choose to breast feed are smarter on an average, so that the effect passes on to their babies.

Immunisation

The vaccine helps to stimulate the body's immune system of the child to make antibodies against viruses and bacteria. Normally, after a person fights off an infection, the immune system remembers and is better able to defeat that infection. Vaccines create the same beneficial responses without the illness.

Currently most of the children in the world are vaccinated against different diseases by age two. They should have protection against the following types of infection:

(i). Diphtheria, in which a thick covering forms in the throat, leading to severe breathing problems.

(ii). Tetanus, in which muscles involuntarily tighten, so that breathing becomes difficult or impossible.

(iii). Measles, which includes not only an uncomfortable rash, but also high fever and brain infection.

(vi). Mumps, which can include fever, headaches, deafness, swollen glands and painful swelling.

(v). Polio, which can cause paralysis.

(vi). Hepatitis B, an infection of the liver that can result in chronic liver damage and ultimately liver cancer.Thus vaccination protects children from those diseases which have a negative impact on the child development process.

Table 1.4. National Immunisation Schedule for Children

NAME OF VACCINE	WHEN TO GIVE	DOSE	ROUTE	SITE
FOR PREGNANT WOMEN				
TT-1 or Booster	Early in pregnancy	0.5ml	intramuscular	Upper arm
TT-2	4 weeks after TT-1	0.5ml	intramuscular	Upper arm
FOR INFANTS				
BCG	At birth or any time up to 1 year	1.1ml-0.05ml (up-to 1months)	Intra-dermal	Left upper arm
OPV-O	At birth if delivery is in institution, but can be given up-to 2 weeks	2 drops	Oral	Oral
OPV-1,2 and 3	At 6, 10 and 14 weeks but can be given up-to 5 years	2 drops	Oral	Oral
DPT-1, 2 and 3	At 6,10 and 14 weeks but can be given up-to 2 years	0.5ml	Intramuscular	Mid-outer thigh
Measles	(9-12 months) should be given up- to 5 years	0.5ml	Subcutaneous	Right upper arm
Vitamin- A	At 9 months with measles	1ml	Oral	Oral
FOR CHILDREN				
DPT – Booster	16-24 months	0.5ml	I/M	Mid- outer thigh
OPV – Booster	16-24 months	2 drops	Oral	Oral
Vitamin – A	16 months with DPT/OPV Booster, 24-30 and months (minimum interval between two dose in 6 months	2ml	Oral	Oral
DT	5 years	0.5ml	Intramuscular	Upper arm
TT	10 and 16 years	0.5ml	Intramuscular	Upper arm

Note: Bacillus calmette vaccine (BCG), oral polio vaccine (OPV), Diphtheria pertussis tetanus (DPT), Tetanus Toxoid (TT); Source: Ministry of health and family welfare (Government of India)

Table (1.4) shows the details of the vaccines that given to the infant from the time it was in its mother's womb to till childhood. The vaccine must be given at the right age, right

dose, right interval and the full course must be completed to ensure the best possible protection to the child against disease.

1.6. Health Schemes and Policies in India

Several plans and policies have been adopted by Government of India since independence to strengthen the health care system in the country. Health planning in India is a fundamental part of nationwide socio-economic planning. Health planning in India has been formulated by a number of committees. These committees are appointed by Government of India to assess the accessible healthcare situation and to advance towards Health For All (1977), National Rural Health Mission (2005), accredited social health activity (ASHA), integrated child development scheme and Anganwadi workers (1975), Janine Suruksha Yojana (2005), Janani Shishu Suraksha Karyakaram (2011), and Indradhanush immunization programme (2014).These are the schemes and policies that have been implemented by the Government of India so far for achieving the good health for child.

(i) Janani Suraksha Yojana

It is a National programme of health introduced by the Government of India during 12th April 2005 by the Prime Minister of India. It is a nation-wide scheme whose objective is to enhance the enrollment for institutional delivery especially among the poor pregnant women and to reduce the maternal and neo-natal mortality rate. The thrust of the JSY progrmme is to enlarge the institutional delivery as this single factor may also promote the various other behaviors as well, like delivery by a skilled birth attendant, timely referral in good institutions in case of any complications, early breastfeeding, postnatal care within 7 days of delivery, exclusive breastfeeding and the adoption of postpartum contraception etc.

Since the adoption of the 2005 policy, there has been sequential improvement in health care facilities in all over the country. Now the share of institutional delivery at public facilities increased from 37% to 63% in 1998 to 2009. Under the JSY schemes the

pregnant women will also get an incentive payment of Rs 1400 for institutional delivery and Rs 600 for a home delivery conducted by skilled birth attendant.[4]

(ii) Janani Shishu Suraksha Karyakaram

Janani Shishu Suraksha Karyakaram is a centrally sponsored scheme of the ministry of health and family welfare, Government of India for ensuring the development of child health throughout India. The JSSK was launched in 1st June 2011 with the basic developmental objectives of universalising access to and improving the quality of health care services in the countries for all the children and mothers. In other words, the JSSK aims at providing a primary level good quality accessible and affordable health services for both child and mother.[5]

Specifically, the JSSK aims at providing free delivery services to each and every pregnant woman who belongs to below poverty line groups by promoting institutional delivery among the pregnant women. After implementing the programme the ratio of women as well as infant death has been reduced significantly.

(iii) Integrated Child Development Programme (ICDS) 1975

The national programme of nutritional support to child, commonly known as integrated child development programme (ICDS) is a comprehensive and integrated flagship programmed of the Government of India (GoI), launched in 1975. In accordance with the National Policy for children in India, ICDS aims at providing a effective health services to the children especially in main concern areas such as hill tracks, tribal communities, backward rural areas, and urban slums. As per the surveillance of UNICEF (1989) ICDS aims at improving the child's health physically, mentally, socially and spiritually for achieving an appreciable improvement in health and wellbeing of mother and children under 6 by providing health and nutrition education, health services, supplementary food and pre-school education etc. Since independence, many attempts were made for the evolution of integrated maternal and child health services. The ICDS development programme is one of the largest development programmes in the world, it

[4] Wikipedia, 26 july:Janani Suraksha Yojana.
[5] Wikipedia, 26 July: Janani Shishu Suraksha Karyakaram.

covers more than 34 million children in the age group 0-6 years and 7 million pregnant and lactating mother.

(iv) Accredited Social Health Activists (ASHA)

Accredited Social Health Activists is also referred to as community health workers programme instituted by the Ministry of Health and Family Welfare (MoHFW), Government of India. ASHA is also a part of National Rural Health Mission (NRHM) which was started in 12th April 2005. One of the essential components of the National Rural Health Mission is to provide every village / place in the countries with a trained female community health activist. Since from the beginning of the days ASHA played a effective role in almost all over the countries. Accredited social health activists act like a frontline health workers because it links between the government and pregnant women in the community. The key role of ASHA is to identify the pregnant women especially in the rural communities and to facilitate at least three antenatal check-ups (ANC), motivate them and their families to seek delivery care at health facility.

(v) National Rural Health Mission (NRHM) 2005

It is a programme of the Government of India enacted on 12th April 2005, which described the modalities of free and compulsory mission to provide accessible, affordable and quality health care to rural population, especially vulnerable and underserved population groups in the country. The mission aims to achieve infant mortality rate (IMR) of 30 per 1000 live births, maternal mortality 100 per 100 thousand live births and total fertility rate of 2.1 by the year 2012.The mission attempt to get these goals through a set of core strategies including enrichment in budgetary outlays for public health, decentralized village and district level health planning and management etc.

(vi) Mission Indradhanush Immunisation Programme (2014)

Indradhanush immunisation programme is a universal immunisation programme in India started by the ministry of health and family welfare (MOHFW) government of India on 25th December 2014.Its a free of cost vaccine provided under the age group of 2 years children as well as pregnant women to prevent from the seven different vaccine

preventable diseases, full immunisation against the childhood preventable diseases is the right of every child. The seven vaccine preventable diseases are as follows.

(i). Diphtheria

(ii). Pretussis

(iii). Tetanus

(iv). Tuberculosis

(v). Polio

(vi). Hepatitis B

(vii). Measles.

In this programme, there are four round phase of the mission i.e. first round, second round, third round, and fourth round phase. Where the first round of the first phase was started in 7th April, 2015, further second, third and fourth rounds phase were started in the month of 7th December 2015 to 7th January 2016.In the first phase of mission, they had found that across a 28 states, 201 district have a peak number of partially immunised and unimmunised children identified by the government of India. Similarly, the second phase of this programme also wants to achieve the full immunisation in 352 districts which includes 279 mid priority, 33 district from the North East states and remaining 40 district from the first phase to detected the missed out children. Thus the mission has deliberately intended to achieve a goal of high quality routine of immunisation coverage to strengthen the health care systems in our country and also that can be sustained over the year. From the last few years, India's coverage of full immunisation percentage has goes up by 1 percent every year.

1.7. Statement of the Problem

After going through all the relevant reports and literature review it appears that the healthcare system in Sikkim has not been able to cope up with the requirements of the public healthcare system. One of the major challenges human beings face today is the health issue. There is no doubt that health problems are increasing day by day. However protection and prevention of diseases are being implemented very poorly. Rangpo seems to be following this pattern. As per the 2011 census Sikkim has a population size of 6, 07,688 while the total population of Rangpo Nagar Panchayat is 10,450. It covers 5 wards with the total number of households being 2505. Rangpo is situated in East Sikkim. It is the gateway to Sikkim. Though there has been a tremendous advancement in the field of science and technology including health infrastructure, people lack access to healthcare systems in the Rangpo rural area. A significant portion of the population suffers from poor health condition in the rural areas around Rangpo due to lack of suitable health infrastructure for a population of more than 10,000 (census 2011) with only one primary health centre (PHC) to look after all the five wards. This is not sufficient for the healthcare needs of the people. In the villages around Rangpo town, a significant fraction of population has no access to proper healthcare facilities and hence healthcare becomes a serious issue here. Other problems include lack of a hospital, adequate health centers, and accessibility of health services to people, especially those from rural areas. Improper health infrastructure has become an issue of disquiet for the people. Though the political elite and the wealthy can afford high standard treatment in better hospitals the poor people from the rural areas sometimes cannot survive due to lack of proper healthcare facilities. The people of Rangpo have been facing problems like lack of basic medical facilities, shortage of specialists, medical staff and equipment for many years. The next nearest medical centre is at Singtam which is about 20 km from Rangpo which poor people cannot afford to travel to and adds extra burden. Poor families obviously cannot afford to go for treatment in private hospitals as the cost of treatment is too high for them.

1.8. Research Question

The questions that the present study tries to address are:

1. To what extent can the changes in per capita income, parent's education, working status, poverty and socio-economic status affect health of the children in a society?
2. What are the factors which extensively affect the childhood immunisation coverage in East District of Sikkim?

1.9. Objectives of the Study

The study tries to explore the importance of the child health care system in North-East India and also tries to analyse the problems associated with child healthcare in the East District of Sikkim.

1. To understand the child health care system in North-East India.
2. To identify and estimate the impact of underlying factors associated with childhood immunisation in East District of Sikkim.

1.10. Proposed Hypotheses

The following hypotheses will be considered for the present work.

1. The probability of achieving a good health for the child in North-East India is significantly affected by various socio-economic factors as well as environmental factors.

2. Childhood immunisation in East District of Sikkim is impacted by underlying factors associated with it.

1.11. Database and Methodology

Coverage and Data collection

The proposed study will be based on both primary and secondary data. The nature of data will be both qualitative as well as quantitative. For the first objective, data will be collected from secondary sources like primary health centers (PHCs), sub-center (SCs), community health centers (CHCs), district hospitals, Ministry of Health and also from National Family Health Survey (NFHS) etc. The present study will consider all eight states in north-east India, i.e. Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim and Tripura.

Source of Date

Data for the study will be obtained from the three successive rounds of the National Family Health Survey (NFHS) conducted during 1992-2006. The first round of NFHS was conducted in 1992-93. The second round of NFHS was conducted in 1998-99 while the third round was conducted in 2005-06 respectively. Primary survey will be carried out in different parts of East Sikkim where the respondents will be chosen on the basis of purposive and convenience sampling. The present study consists of total 204 sample from three different sub-Division of East Sikkim (viz, Gangtok, Pakyoung, Rongli). The relevant information will be collected from the parents of the child with the help of structured questionnaire designed for the purpose. Thus the information shall include individual characteristics such as age of the child, gender, mother's education, antenatal care (ANC) visit and availability of health card etc. Data on household characteristics like size of the family, working status of the parents, distance from hospitals, living standard, parent's income, caste, religion etc will be collected.

Nature of Data

The present study will be consider the factors which is related to the child health care in North-East India such as IMR, TFR, MMR, CBR, CDR, Percentage of fully and Partially immunizes children, Neonatal mortality rate etc.

Data Analysis

The proposed methodological tools for the study will consist of using a multinomial logit model for both primary and secondary data analysis.

The study will utilise the multinomial logit model for estimating the significant determinants of child immunisation coverage and attaining a good health of the child. Immunisation is considered in one of three observable states, namely, (i) no immunisation, (ii) partial immunisation, and (iii) full immunisation.

The decision of parents to immunised children is described by the following model.

$$\mathbf{Y_i = \beta X_i + U_i} \text{ ..... } \mathbf{(i)}$$

Where

$Y_i = 0$: $H_i < 0$, $I_i < 0$ (child neither immunized nor attended good health)

$Y_{i=} 1$: $H_i \leq 0$, $I_i \leq 0$ (child partially immunized and partially attended good health)

$Y_{i=} 2$: $H_i > 0$, $I_i > 0$ (child fully immunization and fully attended good health).

The proposed explanatory variables can be divided into three parts as follows:

a) Demographic characteristics such as age, gender, birth order, size at birth, duration of breast feeding, age of mother and antenatal care (ANC) etc.
b) Household characteristics such as standard of living (low, medium, high), caste, religion, education of the parent, employment status, income, family size, exposure to mass media, etc.
c) Community characteristics like place of residence (rural, urban), distance from hospitals, availability of doctors, and avability of Primary health centre (PHC).

Chapter - 2

Literature Review

As per the many of the researchers the status of child health care basically depends on three categories of causes viz., environmental factors, demographic factors and socio-economics factors. Environmental factors include drinking water, toilet facilities, sanitation and locality or sorroundings. Demographic interrelated factores includes sex of the child, parity, age of mothers, antenatal care (ANC) visit and health cards etc. Socio-economic factors include mother's education, place of residence, religion, caste, standard of living, working status ofparents, mother's exposure to mass media, number of household rooms available etc.

2.1. Environmental Factors and Health Issues

This part of the study and literature review exhibit the environmental scenario and its impacts on child health. Some of the environment related issues are highlighted by Bradbury (2004) has worked on the issue of environmental effects on child health. According to him, 6.4 percent of deaths among children under the age of 4 years occur because of outdoor air pollution while the remaining 3.6 percent of deaths in the same age group happen due to indoor air pollution. Indoor air pollution results from factors like inadequate water and sanitation while outdoor air pollution is caused by motor vehicle emissions, second hand smoke etc.

WHO and World Bank (2007) declared that high level of malnutrition is actually caused by bad sanitation and diseases specially in young children. Although lack of food is one important reason for malnutrition, in developing countries millions of childrens die mostly from avoidable but chronic environmental diseases.

According to Sullivan and Elizabeth (2007), environment is a place where people can exchange their ideas and views. They had carried out the studies on health and well-being of the people directly linked to the environment i.e., (where they live, work and learn

etc). They have tried to say that if people live in a healthy environment they can learn to do things properly. Therefore community behavior also has a great impact on the development of child health. Bhattenheim (2008) shows how an unhealthy environment is affecting the health condition of the rural people. According to him more than 60% of children die due to improper sanitation facilities. Due to improper water and sanitation facilities they may easily fall prey to different kinds of diseases like diarrhoea, variation in height or weight etc. These kinds of problems are especially applicable to rural people as they might not have proper toilets or after using these they do not follow the practice of washing hands properly. So this kind of unhygienic practice will also have a harmful effect on human life. Devchara et al (2007, 2008). According to them environmental issues that affect child health include water, sanitation, hygene, indoor air pollution, diseases like malaria etc. The top three indicators affecting the health of children very badly in developing countries are water, sanitation, hygene, indoor air pollution.

2.2. Policies and Implications

This part mainly shows the policies and their importance in the maintenance of good health of the child, Das and Dasgupta (2000) critically evaluate the immunisation programme on the basis of demographic trends and child health. Immunisation of children protects them against preventable diseases. It should be mandatory to have timely vaccination at the age of 5 and the importance of the vaccination needs to be imparted to the parents. Every year more than 46% of children are dying due to the low birth weight and other child diseases which are caused by the lack of a proper programme management system. It is also observed that child healthcare depends on the stability of the government. Studies by Andrea & Senauer (2003) focus on the link between the Women, Infant and Child (WIC) Program and the health of Preschool aged children in USA. The WIC program provides foods with specific nutrients to pregnant and lactating women, and to children up to the age of five, especially in low-income households. WIC focuses on nutrients which have been found food deficient in the diet of the target population, such as protein, calcium, iron, and vitamins A and C. The foods in the WIC package also provide vitamins D and B-6 and folates. WIC gives more preference to children who are at a nutritional risk or have certain health conditions.

Bredenkamp et. al. (2006) had tried to examine the effectiveness of the Integrated Child Development programme in addressing the challenge of child under nutrition in India. They found that although the ICDS programme appears to be well-designed and well-placed to address the multidimensional causes of malnutrition in India, there are numerous mismatches between what the ICDS programme proposed and its actual implementation that prevent access to children suffering from under nutrition and also that ICDS potential failed to cover the targeted group. ICDS gives more emphasis on the provision of additional feeding and preschool education to children aged four to six years, at the expenditure of other programs and components that are crucial for combating persistent undernutrition, a failure to effectively reach children under three and, ineffective targeting of the poorest states and those with the highest levels of under nutrition which tend to have the lowest levels of programme funding and coverage. According to Abhishek & Mohanty (2011) malnutrition among children is one of the major public health concerns in developing countries, where it represents both a cause and a manifestation of poverty. A child with insufficient nutrition in developing countries is usually a consequence of poverty with its attributes of low family income, poor education, poor environment and housing and inadequate access to food, safe water, and healthcare.

2.3. Expenditure on Health

Ellis et al (2000) highlight the issues of poor quality of government health expenditure. They state that expenditure on health in the public sector is very low as compared to the private sector. Less expenditure in public health means less productivity, which leads to fall in Gross Domestic Product (GDP), thus slowing down the performance of the country. Thus we can say that health is wealth for the people. Government policy on child health issues have been highlighted by Bhatia and Yesudian (2001). According to them, the financing system of government was not efficient for poorer sections of society. The government has introduced a programme called Reproductive and Child Health Services in India which is tax financed and provided through the supply side financing mechanism. In other words, the government runs these schemes only for collecting revenue from people who do not have proper financing;

alternatively the existing schemes are unable to target the poor people with a lack of user choice and the absence of linkages between the providers of payments and performance. Hence there is a need for developing innovative financing mechanisms, which are able to target scarce resources towards those who cannot afford to pay.

Studies by Srinivasan et al (2007) talked about the decentralisation and integration of the Reproductive and Child Health Programme in India (RCH). It has been formulated in almost all districts and funds have been allotted for implementing this programme in different areas. RCH programmes are being implemented as an integrated package of a number of reproductive and health services, including the traditional antenatal, natal and post natal care for pregnant women as well as infants including immunisation of children against common vaccine preventable diseases. Analysis reveals that, the state-level RCH services are significantly more cost effective than the district level services. Thus the speed of annual progress in RCH has decreased by half except in case of polio vaccination. Decentralisation and integration of basic healthcare services may not be effective unless it is monitored centrally and backed by full time health (medical/paramedical) professionals at the delivery level.

Gupta and Khaira (2008) have contributed a study where they have tried to highlight issues like flaws in child nutrition and health governance due to the misguided policies and untrained or weak leadership .The scheme or the policies meant for a particular section may not reach them; in other words the weaker sections of the society will be deprived of the benefits meant for them.

Singh (2013), have a study on trend in child immunisation coverage in India. Although the child immunisation is consider as a highly cost effective life saver medicine which prevents the children from risky or hazardous disease. As compare to developing nation, Although average annual rate of under five mortality has been gown down by 3.1 percent during 1990-2009 but this much of percentage change in mortality rate will not going to help to obtained the target of fourth millennium development goal (MDG) of India by 2015.so, as per Singh has given a more emphasis on vaccination to child has play a essential position in achieving the goals specified in the millennium development

(MDG). In India about a fifty percent of children age group 12-23 month still not receiving the essential immunization coverage nearly 20 percent of children was died in every year because of vaccine preventable disease among children under five years of age. Thus the present study advises that the sustained evaluation of the work performance of the health system services reduce a gap between the groups of a child. Study also recommends that targeted involvement group have a better performance conventionally as compare to neglected group growing inequality in immunization coverage due to less focus or less targeted intervention and lack of continuous and systematic assessment.

2.4. Socio-Economic Factors

Socio-economic issues highlighted by the many of the researchers can be taken as major factors for the purpose of designing quantitative models for child health. Variables used for this purpose include income and education of the parents, working status of the mother etc. Mother's literacy rate and schooling also have a greater impact on child health and its survival.

Gok (1983), for the first time in economics, he has used a sibling data to estimate the effects of family background on child health by using a multinomial regression method. He has reported that the variable affects the child heath i: e parents schooling, mother labor force status, and family size etc. family characteristics are the predominant features for determinants of child health in conventional multivariate regression models, it is clear that significant family influence is exercised on child health, as per the result 85 percent of the variance explained by the sibling data and the remaining unexplained is determined by regression analysis. Therefore the higher education level of parents, well living standard and also a less family size are required to obtain a good health of child in a childhood level. Virginia & Gok (1983) conducted studies to examine the effects of family background on child health by using sibling data in health economics. According to them about 21.6 per cent of the effects on child health are drawn from the family background whereas 42.8 per cent mainly occurred due to common diseases. Family background characteristics include areas like schooling of the parents, mother's working

status, (private, agriculture, regular etc) status of family and family size etc., all of which have a great influence on child health.

Education is one of the important tools for human being thought the life. In this study Gursoy Akile in (1994), also shows the importance of parent's education (father) on infant health. In a cross-national study by him in 1985 in Turkey, he has found that father education was more powerful explanatory variable associated with infant survival. Which is suggested that father with higher education may have a class and status differences, though after his finding, he has mention that father should have at least primary level of education then only they can protect their child from dying before to reach their first birthday as per their report every year 1.6 million infant are more likely to die because of only parents are not having education.

Sandiford et al (1995) show that mother's education is the key factor that leads to changes in a woman's values, beliefs, power or knowledge which in turn leads to lower child mortality either through better domestic child care or more effective use of health. Also the educated mothers are more likely to use professional antenatal care compared to non educated ones. Parental education plays an important role in the use of daily routine, antenatal care and in maintaining good health of their children. Educated mothers are always updated with access to information as compared to uneducated ones. The Canadian Public Health Association (CPHA) in (1997) discussed the direct impact of socioeconomic factors on human health. For example factors like poverty, unemployment, education, living and working conditions, families, friends, workplaces, social support and physical environments all have significant direct impacts on health. In almost all societies health status is directly linked to social status. Those from a higher socioeconomic position are usually in good health and generally live longer compared to those from a poorer socioeconomic condition. Thus a slope exists in the rate of disease from the top of the social ladder to the bottom as almost every disease had a greater impact on a human being's life according to the income range.

Anil (2000) discussed the socio-economic factors and healthcare structure related issues that impact the effect of diabetes and consequently its costs. Factors that influence delay

in diagnosis also determine complication rates and thus costs. Chaiana et.al. (2002) According to them poor child health situation is correlated with poor socio-economic condition of parents. In general children with untreated dental caries and those with poorer socioeconomic background are more likely to report poorer health condition of child. The negative impact of untreated caries of income on child cognitive development remains significant even after the change sex and socioeconomic. This study also shows that the improvement of child health influenced by socio- economic conditions and dental clinical status this is the most important findings of this study. Children with poor health as present with more rigorous impacts on their quality of life. It is well established that individuals from low socio- economic backgrounds are more likely to be exposed to various risk factors which affecting the health, and that health contributes extensively to the quality of life not only allowing for practical domain but also psychological and social dimensions. Lower income is linked with poor health status of the children by Carlson and Senauer, 2003) through a variety of factors such as lower access to health services and health information along with a more limited ability to obtain acceptable nutritious foods. Lower income leads to low nutritious food for mother, which in turn creates the problem of stunting, low birth weight, low infant mortality rate etc. in children. The supply of greater nutrition to the mother means improvement in the status of vitamin A in the mother's health and her breast milk and is likely to contribute to the improved health of the infant. Strohschein (2005) shows how low household income will have a negative impact on child status. Low household income is associated with worse child mental health as well. Therefore it can be shown that low household income is highly associated with high levels of depression and involvement in antisocial behavior. The author highlights the importance of understanding the way in which children are highly influenced by their parents' income.

Inchani and Lai (2008), utilized a data from the census of India (2001) to analyse whether the mother education level have an impact on child sex ratio or not. They had used statistical tools like student t-test and chi-square test for this purpose. There is a variation in child sex ratio between rural and urban areas of India and statistically shows that child sex ratio exist higher in rural than urban areas because of variation in educational level between mothers. Therefore mother education level play an important role in deterring

the child sex ratio in india or mother eduction is a important indicator for child general development process. In Indian framework child sex ratio is always high in rural areas as compared to urban because in rural areas once women completed the primary level they will stop them self for further study.

Peter (2011), and Kanjilal et.al (2010) highlights the poor health status of rural children in India. The National Family Health Survey (NFHS) and the National Nutrition Monitoring Bureau (NNMB) in 2005-06 shows that 8.4% of children are under nourished due to the sustained decline in per capita calorie consumption over the year 2005-06. Infant and child mortality rates of rural areas have been recorded to be high as compared to urban families. Child vaccination also have been found to be very poor. NSS data shows that average calorie consumption in rural areas was about 10% lower in 2004-05 than in 1983. Thus, the proportionate decline was larger among better-off sections of the population, and close to zero for the bottom quartile of the per capita expenditure scale. In urban areas, there was little change in average calorie consumption over this period. Acording to the author, the nutritional status of rural people was found to be exceedingly poor due to improper nutritional diet. A higher burden of child nutrition on the state or nation as a whole will have a greater impact on economic development.

According to the study of Dahl and Lance (2012) lower income of the parents has a negative effect on child health development. They have tried to estimate the causal effects of family income on children. The outcome has been the endogenity of income, that is, children growing up in a poor family are less likely to have an adverse home environment and are also more likely to face other challenges that would continue to affect their development even if their family income increases substantially. Andre and Mizell (2015) have showed the immediate and long term effects of parents' income on child behaviour that could lead to long term effects on child health development (e.g lower self control, poor school performance etc). It was found that children from low income families engage in a higher level of bullying than those from high income families.

Ramaiah (2015) reveals that the poor health status, including higher morbidity, lower life expectancy and higher rates of infant mortality is linked to race, ethnicity and caste. It is also revealed that any kind of discrimination affects people's health as access to healthcare becomes difficult and quality of health services also worsen if he/she belongs to a lower caste or ethnicity.

2.5. Constraints in attaining a good health

This portion includes the constraining factors towards attaining a good health, such as availability of doctors, medicines, healing systems, priority on gender etc.

Kenneth & Upchurch (1995) used data from Demographic and Health Survey (DHS) which shows a gender difference among infants and also the impact of discrimination on infant health status. According to DHS data mortality rate is high under the age of five in developing countries due to massive gender discrimination. The disadvantage for girls is the largest in the young child (1-4 years) age group. In this age range, care of the child is more important than genetic factors in determining mortality risk in infancy. The disadvantages are largest in the Middle Eastern countries. It was found that girl mortality risks are 60 percent higher than those for boys after the neonatal period. It was also noted that girls were fed less and suffered more malnutrition. Infection rates were similar but boys recovered more quickly than girls, and parents purchased more medicines for boys than for girls. This type of discrimination is still practiced in India which leads to a negative impact on the national growth rate while also promoting a bad quality of health in society. Sweetman (2002) states that a woman is less concerned about how many child she bears or at what interval as it is all decided by the man, who is the bread winner of the house. A woman cannot independently decide the healthcare she wants to take or give to her child as they need financial assistance from the husband. Mahmood (2004), linked poverty with child morbidity and health seeking behavior in developing countries. As per their finding the most common illnesses among the children from poor families are intestinal infections including diarrhea, fever and viral diseases and also the Lack of affordability of medical treatment was among them are the main reasons for not visiting any health facility during the child illness. The present analysis also determined that poverty has adversely influenced the nutritional status of children. The basic issue is how

to reduce household food insecure especially among the poor family. The government of Pakistan initiated some target programmes to transfer cash benefits directly to the poor including Zakat and food support programme. But there is a need to improve the target efficiency of these programmes in Pakistan. Therefore higher the poverty rate higher will be the rate of morbidity problems faces by developing countries people. Ballet and Biggeri (2005) have carried out a study to examine the relation between child activity and the capability approach. The paper explores the use of the capability approach towards children as a subject of human development. This means that children are not simply recipients of freedom but active social members and agents of future in their communities with their own priorities, strategies and aspirations. As children grow up they are able to express their point of view, values and priorities because today children's are tomorrow's contributors.

Imre et.al. (2006) have discussed the issue of the lack of well qualified professional doctors in Hungary. It was one of the greatest challenges faced by the Hungarian people in early and mid 1990s. According to them lack of doctors is one of the major problems caused by the lack of good medical training institiutions.

Similar studies has been observed by the kumar and Monthey in (2011), they has been observed that urban population exhibit in different types of poverty, morbidity, mortality and nutritional status as compared to rural population. This was happened because due to the shifting pattern of poverty from rural to urban areas in developing countries. The number of urban poor is increasing day by day in faster rate than those in rural areas because of only high rate supply of rural people in urban areas. So, higher poverty level will raise the cost of health care services which leads causes of inequality in health and health care utilization within urban areas.

Mathew (2011) highlights the issues related to primary health centers in India. Performance of primary health care centers in India are unsatisfactory due to shortage of disciplinary medical expertise, laboratory facilities, and lack of others infrastructure facilities and also the deficiency of life saving medicine. In each village one primary health centers (PHC) will cover at least 25,000 per population and each centre is

equipped with the provision for preventive, curative, promotional and rehabilitative aspects of public health and has an effective referral system. And also they have a first level of contact and direct link between each individuals and the national level health care system for providing a door to door health care services to the people in a community. But the nation has failed to provide those kinds of facilities to the people in a community. So, the people are totally deprived from the benefits in the primary health services in public sector and they go for private sector health care services which are very expensive for them. In India almost sixty to seventy percent of the people are required to look for medical helps in private sector. Thus the present study concluded that, this circumstance is faces by the people because of the irresponsibility and lack o proper planning on the management system on the part of the Government. Thus the consequences of this carelessness have a negative Impact on health of the common people as well as acquiring an ill health and poverty which is hamper development.

Ram & Upadhayay (2012) dealt with health status of Sikkim and described the manner in which problems of health and diseases are solved by their community health doctors by utilising the flora and fauna availble in the himalayas.

2.6. Health and productivity

The demand of child care is heterogeneity in nature because it significantly effects by the location, hours and cost for the overall development of child. After their analysis they found that parents who really care about their infant overall cognitive development preferred to send their kids in a baby care centers but there are some parents exist in society who gives an importance to choose a cost, hours and time etc rather than overall development of child at home. For them if demand for child care higher in nature will reduce income but child will get a higher quality of caregiver. Therefore there are various processes for child developmental care but process should have a positive impact on child cognitive development Waite ei.al (1990). There are many studies which show the impact of gender inequality in child health. Rosenzweig (1990) econometrically test ‘infant morbidity’ and ‘allocation of time’ to analyse incidence of illness on child health. Her infant morbidity is that a young child somewhere between six month and two years of age constantly needs care and attention to reduce the mortality rate between male and

female child. Continuous estimation of health activities indicates that higher the infant morbidity rate will extensively make differential in the capital accumulation between girls and boys in Indonesia. Therefore it's not only the responsibility of government to make nation disease free but also the responsibility of parents to make future prosperity of nation. Arora (2001) has also investigated the impact of good health on the economic growth. Improvement in health facility will increase the human ability and it will increase the pace of long term growth by 30 to 40 percent. As per the WHO estimation report in (2006) 9.5 millions of children died before attending their fifth birthday in developing countries. Around 32 percent of children in developing countries are stunted and 10 percent are wasted because of sub-optimal breast feeding practices. Especially non exclusive breast feeding for first six month of life results in 1.4 million deaths and 10% of the disease burden in children younger than 5 years.

The member of world health organization articulated the interest in improving the deep understanding of linkage between the investment in health, economic growth and poverty reduction. There studies in Latin America during the year (2005) Caribbean countries had shows that improvement in GDP is strongly associated with life expectancy rate because life expectancy at birth is single strongest explanatory variable of increase in countries GDP. The finding of their study suggests that for any additional year of life expectancy there will be an additional 1 % increase in GDP 15 years later.

Noonan et.al, (2005) asserts that poor child health as a mass phenomenon occurs not only because of parental wage rate but because of the parents concerns for household survival as well as less time spending with the child. They had decorated that the effects of child health on the labor supply of father's .which suggest that, children with high risk of health problem may reduce the working hours of the parents (father) which leads a less health investment then their previous condition.

Many Research has revealed that a direct trade-off exist between child health and schooling. If we viewed it narrowly differences between child health and schooling it will be clear. The relationship between child health and schooling given by Sisk (2005) and they had provided an extensive proof that deprived quality of child health damage to the children education level. As higher the chances of getting poor health the more will be

chance of dropping out from the education. As for the Yeravdekar et.al (2008) the inequality and poverty are the two major root causes of ill health in our country (India). The first health medical services facility established by British government in India during the 18th century to provide benefit only for the nationals, armed forces, and privileged civil servants only. Where indigenous system of medicine were totally neglected, as per the 2011 census in (India) 68 percent of Indian inhabitant lives in rural area whereas only 20 percent of medical facility located in that particular area. So, this biasness lead high maternal and infant mortality rate, the main reason for them is a financial problem, most of them can't afford a high medical care facility, other major reason are long distance of the public facility , long wait time, and inconvenient hours of operation. All the issues are mention by them are the major factors of attending an ill health in India. World health organization, world health organization, WHO in (2009) brings together the fundamental knowledge about the infant and child feeding practices because the optimal feeding practices lead the most effective affection to improve the child health.

Bajpai and Dholakia (2011) studies on addressing the issues related to the provision of quality services of accredited social health activists (ASHA) in the community. Central government has introduce a ASHA programme in each and every community to reduce the maternal and infant mortality rate by providing all the facilities to the people but in most of the places they have a low contact between the ASHA and pregnant women due to the social distance and also ASHA themselves have a lack of knowledge and skill to recognize post-delivery danger signs for mother and newborns and the immediate care that need to be taken.

Arif (2014), in this study he has tried to examine the health status of children in Pakistan by using two important parameters i: e morbidity and malnutrition measured by with the help of height and weight of the child as per the age. Similar study has been contributed by World Bank in (20014) examined the correlation between poverty and child malnutrition, using the Pakistan Rural Household Survey (PRHS) and they had shows a positive relationship between the household income and nutritional status of children although it piercing towards the occurrence of strong externality effects within

communities in the child's well- being. The morbidity and malnutrition has a linked with food security and the income of the parents. As higher the income level the chance of attending a good health will be more chances. As per their study they had found that increase in avability of calories and decrease in diarrhea both will increase the probability of improvement in health of the child.

Maternal depression is one of the most important factors of affecting the child health during childhood which have not been overlooked very much till now. In these articles he has tried to identify that how maternal depression linked to child physical health. He has also mention that maternal depression is one of the major responsible factor for attending a poor health among children ages six months to 11 years because children who live in this situation are chronically depressed mother may be more in danger children of mother to have a higher chances of getting poor health as well as poor cognitive development. When depression is chronic and frequent mother may be less supportive or stressful and less supportive circumstance which may reduce the mother ability to engage in prevent their children from vulnerable situation Turney in (2016).

2.7. Research Gap and Justification for the Study

The literature on child health is enormous. However there are certain gaps in research which the present study intends to fulfill. Firstly, child healthcare is a major problem throughout the world. However there are few studies showing the relationship between the child health and poverty or human deprivation. There is also a lack of empirical studies on child health and mother’s education.

Besides, Sikkim remains one of the most neglected areas with regard to studies on child health, though it almost stood in good position in monitoring the health but not in an efficient manner.

Researchers from various fields have concentrated on diverse topics. The present study on health deals with the failure of government health programmes in motivating the rural people. The study focus on the effects of a variety of socio-economic factors on child health in Sikkim. The existing literature in this field does not seem to have addressed this

issue. There has also been hardly any study on this particular issue in Sikkim. The proposed research is an attempt to bridge this gap.

2.8. Plan of the Work

The Proposed dissertation paper is to be organized as follows:

Chapter 1: Introduction

Chapter one includes the introduction of the proposed research. It also introduces the problem of child health care in North-East India in general and Sikkim in particular.

Chapter 2: Review of existing Literature

Chapter two elaborates the theoretical background of child healthcare and it also provides the research gap and relevance of the present study.

Chapter 3: Database and Methodology of the Study.

This chapter outlines the data used for the study along with a description of the methodology applied.

Chapter 4: Results and Discussions.

The fourth chapter summarises the results and related discussions.

Chapter 5: Concluding Observations and Policy Prescriptions.

Chapters five gives the conclusion of the dissertation starting with a brief outlook of the every chapter. It underlines the findings of the field work and the resultant policy prescriptions.

Chapter - 3

Database and Methodology

3.1. Data Source

The present study is based on both primary as well as secondary data.

Source of Secondary Data

Secondary data has been obtained from various sources such as the Ministry of Health and Family Welfare (MoHFW), National Family Health Services (NFHS) etc. Data has been collected on healthcare in Sikkim from sources like Department of Healthcare, Human Services and Family Welfare, Government of Sikkim, and these include available vital statistics on the number of hospitals, number of nurses, midwives available (per thousand population), professional doctors, infrastructural facilities available, as well as crude birth rate, death rate, maternal mortality rate and infant mortality rate of all eight north eastern states. The data is taken from the three successive rounds of the National Family Health Survey (NFHS) conducted during 1992-2006. The first round of NFHS was conducted in 1992-1993; the second round in 1998-1999 and the third round in 2005-2006. The NFHS is similar to other demographic and health survey data (DHS) and it covers broad range topics such as immunisation of children, their nutritional status, fertility, and mortality etc. All three rounds of NFHS data are nationally representative because it has covered more than 99 percent of both the general population as well as child population in India.

Source of Primary Data

Primary data has been collected by conducting a field survey during the period from June 2016 to July 2016 with the help of pre-structured questionnaire. The following sample design has been applied for selection of households.

3.2. Sampling Design

The present study was carried out in different parts of East Sikkim. Initially multistage sampling was used where the entire state of Sikkim was divided into four districts viz., north, south, west and east respectively. Each district is divided into three subdivisions and blocks and finally each block is divided into rural and urban areas. However the present study purposively selects the East subdivision of Sikkim because of higher density of population as compared to the other districts. Moreover, the availability of health care infrastructure facilities is better in the East district of Sikkim as compared to the remaining three districts.

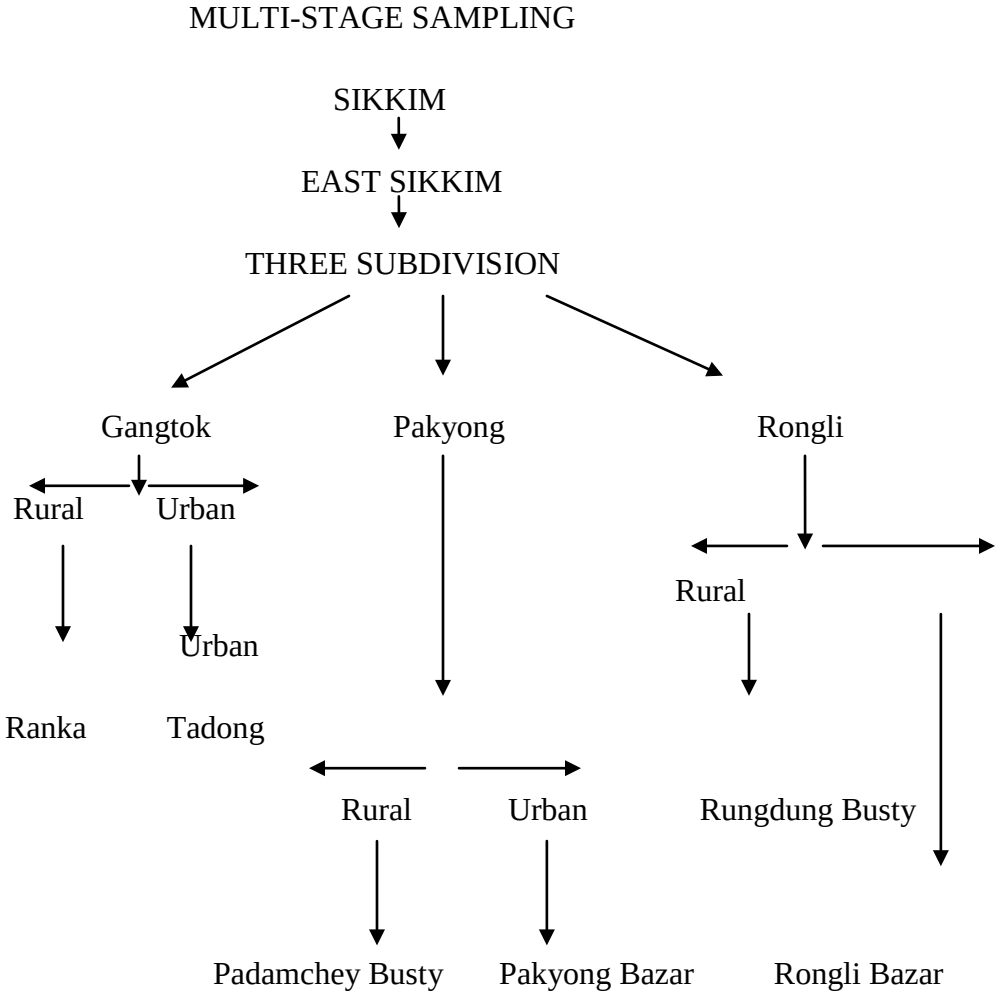

Figure 3.1: Multi-Stage Sampling

All the three subdivision[6] of East Sikkim have been selected for the collection of field level data related to child healthcare. Again from these three subdivision we have selected six different villages in addition to three from rural areas (viz Rungdung, Padamchey, and Ranka) and remaining three from urban areas (such as Rongli Bazar, Pakyoung Bazar, and Tadong) in order to capture differences in attitude as well as to make a comparative study between them. Multistage sampling refers to a sampling process which is carried out in several stages.

The population is first divided into large groups, called first stage units. These first stage units are again divided into smaller units, called second stage units; again the second stage units were divided into third stage units and so on, until we reach the ultimate units[7].

3.3. Location of the Study Area

The following location of the study area has been utilised to collect the data on child health status across different blocks in the subdivisions of East Sikkim. The present study consists of a total 204 samples from three different subdivisions of East Sikkim, with 102 households from rural areas and remaining 102 households were collected from urban areas respectively. We have selected from Gangtok and its surroundings (viz., Ranka and Tadong), for the collection of primary data on child healthcare. Similarly two areas we have chosen from Pakyoung (i.e. Pakyoung Bazar and Padmchey Busty), whereas the remaining two villages were selected from Rongli (i.e Rongli Bazar and Rungdund Busty). The above location of the study area of East Sikkim is shown in the following map (i.e. in fig 3.2).

[6] Gangtok, Pakyong, Rongli.

[7] These first stage units are again divided into smaller units, called second stage units; again the second stage units

were divided into third stage units and so on, until we reach the ultimate units[7].

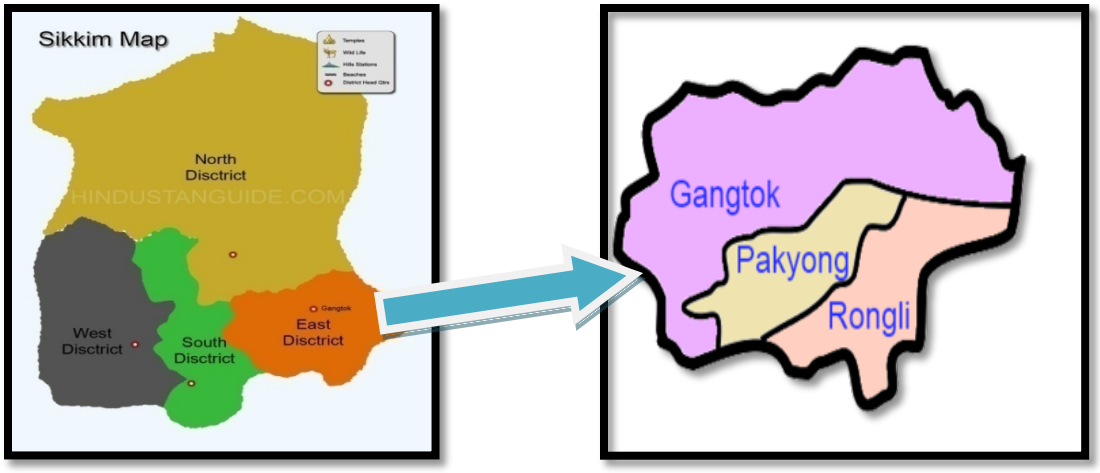

Figure: 3.2 Maps of Sikkim

3.4. Tools for analysis

The following analytical tools have been used for the study:

(i) Multinomial Logit Model:

Present study has used multinomial logit model for estimating the significant determinants of child immunisation coverage and thereby attaining a good health. The multinominal logit model is used because the dependent variable is in nominal form that is considered in one of three observable states, namely, (i) no immunisation, (ii) partial immunisation, and (iii) full immunisation. If there is no immunisation coverage the dependent variables takes the value 0; for partial immunisation it takes the value 1; and for full immunisation it takes the value 2. As per the immunisation schedule provided by the District Hospital of Sikkim[8] each child or infant should be provided the following vaccines at the age of five years like:

(i) Two doses of TT vaccine = (i.e. TT-1 for early in pregnancy, & TT-2 after 4 week of TT-1)

(ii) One dose of BCG = at birth or up to 1 year.

(iii) Four doses of OPV = (i.e. OPV-0 at birth or can be given up to 2 weeks, OPV-1, 2 and 3 at age 10 to 14 weeks but can be given up to 5 years)

[8] Reterived from http://childcare.org/schedule of immunisation.

(iv) Three doses of DPT = (i.e. DPT-1, 2, & 3 at age 6, 10 & 14 but can be given up to 2 years)

(v) One measles vaccine = (given at 9-12 months)

(vi) Vitamin-A = (At 9 months)

In this connection it is to be mentioned that, those children who had received a two doses of TT vaccine, one doses of BCG, three doses of DPT, four doses of OPV, one measles vaccine, and one dose of vitamin A/booster has been considered as a full immunized children. Likewise children who had received at least three doses of vaccine from the entire dose are considered as partially immunised children. Those children who did not received a single vaccine from the entire dose mentioned above come under the no immunisation coverage.

The present study has used the regression model for estimating the impact on child immunisation coverage. Therefore the decision of a child to be immunised is described by the following model as follows.

$$\mathbf{Y_i = \beta X_i + U_i} \text{ ..... (i)}$$

Where;

Y_i indicates the dependent variables

β indicates the Intercepts of explanatory variables

X_i indicates the i^{th} explanatory variable

U_i Captures the errors term

Where;

$Y_i = 0: H_i < 0, I_i < 0$ (child neither immunised nor attained good health)

$Y_{i=} 1: H_i \leq 0, I_i \leq 0$ (child partially immunised and partially attained good health)

$Y_{i=} 2: H_i > 0, I_i > 0$ (child fully immunised and fully attained good health).

The information on child immunisation was collected for only new births to five years of age from selected areas. Information on child immunisation was collected through the immunisation card or health cards of the child and mother. The multinominal logit model is mainly used to capture the importance of immunisation coverage on child health and is also used in evaluating the impact of several socio-economic as well as environment

factors. Where socio-economic factors like education of parents, mother's age, standard of living, religion, caste, income of the parents and accessibility of healthcare services on childhood vaccination. However environmental related factors like , family size, exposure to mass media, place of residence (rural and urban), drinking water, toilet facility, sanitation, place of residence, number of household rooms available, distance from hospitals, availability of doctors, availability of primary health center (PHC) etc.

The relevant equation for multinomial logit model is as follows.

$$Y_i = \beta_0 + \beta_1(BOC_i) + \beta_2(ME_i) + \beta_3(LOC_i) + \beta_4(SOL_i) + \beta_5(MWS_i) + \beta_6(EMM_i) + \beta_7(CASTE_i) + \beta_8(REL_i) + \beta_9(HC_i) + \beta_{10}(SC_i) + \beta_{11}(MAGE) + U_i \quad \text{.....(ii)}$$

Where;

$\boldsymbol{\beta_0}$: Intercept Term.

$\boldsymbol{\beta_1}, \boldsymbol{\beta_2}$ ..... $\boldsymbol{\beta_n}$ are coefficients of the explanatory variables.

Apart from multinominal logit model, present study also used a chil-square test and Bi-variate frequency distribution.

(ii) Chi-square Test:

Chi-square test is commonly used for testing a relationship on categorical variables. Basically a chi-square test can be used to test the null hypothesis that the given attributes are independent of one another. If there are two attributes 'a' and 'b', the null hypothesis is given by H_0: attribute 'a' and attribute 'b' are independent. If $p \leq 0.05$ we may not be able to accept the null hypothesis. In that case we accept the alternative hypothesis H_1. This implies that attributes 'a' and 'b' are associated with each other. So, the chi-square test is used to determine whether there is a significant difference between the expected frequencies and the observed frequencies in one or more categories.[9] Therefore it can be used to understand the significance of the effects of immunisation coverage across selected socio-economic variables. So, the progress rate of each vaccine helps to know the progress rate of one vaccine to another.

[9] Wikipedia, 23 September: chi-square test.

The formula for calculating the chi-square test is given below.

$$\chi^2 = \sum \left\{ \frac{(F_0 - F_e)^2}{F_e} \right\}$$

Where F_0 indicates the observed frequencies and F_e the expected frequencies of the i^{th} rows values and jth column values divided by sum of total observation.

(iii) Bi-variate frequency distribution:

Bi-variate frequency distribution is one of the simplest forms of quantative analysis, which involves the analysis of two variables (x, y) for the purpose of determining the empirical relationship between them. Bi-variate frequency distribution is also used to establish the correlation between the two variables.

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Chapter - 4

Results and Discussion

This chapter provides a snapshot of the results of the study along with their interpretation. Present chapter has made an attempt to examine the child health care system in North-East (NE) India in general and particular in Sikkim. Thus the study has used a descriptive statistics and Compound Annual Growth Rate (CAGR) in order to understand the growth rate of child health care system in North-East (NE) and in Sikkim over the year. Whereas to evaluate the significant effects of several socio-economic variables on child health through immunisation coverage in the east district of Sikkim, we have divided this chapter into three sections – descriptive statistics using univariate frequency distributions, followed by the same using bivariate frequency distributions, and ending with the analysis of the data using the multinomial logit model.

4.1 Status of Child Population in NE India

There has been decline in child population over the year, as in Table 4.1 reveals that the child population of Sikkim was highest 1.31 % during 2001 census compared with child population of NE states during 2011 census with figure 1.10 %.

Table 4.1 Percentage change in (0-14 years) age of population of Sikkim

Year	States	0-14 age group child population in NE states	% of child population of Sikkim with respect to NE states
2001	North East States	14407353	100
	Sikkim	188907	1.31
2011	North East States	15000852	100
	Sikkim	165937	1.10

sourc: Census of India (2011)

When child population is decreasing in trend in Sikkim it may be because that people are aware for not to have more than two child or another reason may be child are dyeing due malnourished. The state-wise total child (0-14years) age group population of NE Region

reported in Table 4.2; the CAGR estimation has been done to examine the percentage change in child population of child over the year. The child population growth in Manipur was highest with growth rate at 2.20 % per annum followed by Meghalaya, Meghalaya and Arunachal Pradesh with growth rate of 1.84 %, and 1.08 % per annum respectively. Percentage change or growth rate of child population is relatively lower in Sikkim by -1.28 % per annum followed by Nagaland (-0.70%) and Tripura (-0.54%) per annum. Sikkim is lowest in terms of growth of population of child between age group (0-14) years amongst the all NE states during 2001-2011 Census.

Table 4.2 State wise growth rate of (0-14) age group population of NER

State wise growth rate of 0-14 age group of child population								
Year	Arunachal Pradesh	Assam	Manipur	Meghalaya	Mizoram	Nagaland	Tripura	Sikkim
2001	442825	9970342	706705	980877	313736	728409	1075552	188907
2011	493361	10248899	861688	1177942	356002	679032	1017991	165937
CAGR (%)	1.08	0.27	2.02	1.84	1.27	-0.70	-0.54	-1.28

Source: Census of India (2011)

4.2. Status of Full Immunisation Coverage

Table 4.3 reveals the trend of immuisation coverage between (12-24) months child from (1992 to till 2006) has been observed that the considerable improvement in India as compare to NE states. In case of Sikkim, the yearly average full immunization was highest 46.66 amongst NE states but comparatively less when we compared with India's average. The least immunization of child has been registered in Nagaland with an average figure of 13 per year. CAGR has been used to understand the percentage change in immunisation coverage with progressing year 1992-2006. Negative sign of CAGR child immunization indicate there has been.

Table 4.3 Descriptive statistics of full immunisation coverage of NE states and India from (1992-2006)

States	Mean	CV (%)	CAGR (%)
Arunachal Pradesh	24	15.02	-98.93
Assam	19.33	15.02	-98.94
Manipur	32.66	39.48	-98.82
Meghalaya	15.66	42.49	-98.68
Mizoram	37	22.12	-98.84
Tripura	24.33	18.53	-98.86
Nagaland	13	48.72	-98.26
Sikkim	46.66	50.36	-98.55
India	54	41.24	-98.68

Source: National Family Health survey (2005-06)

an improvement in immunisation coverage. In all the states of NE India have a negative CAGR which indicates that there is a significant improvement in full immunisation coverage over the study period. Sikkim's performance is far better than others states like Manipur, Arunachal Pradesh and Tripura. States like Assam and Arunachal Pradesh were most consistent in immunisation coverage of child while Sikkim was most inconsistent during the fifteen years of study.

4.3. Number of Diseases Infected in Child across NE Region

Table 4.4 shows the causes of diseases during the childhood period from birth to five years of age viz, asthama, tuberculosis, jaundice, and malaria among the eight NE states and India. In India, 2,468 children per 100,000 populations were suffering from asthama diseases, where in sikkim 4,711 children out of 100,000 are died from asthama which was higher than national average. Thus the prevalence of asthama varied considerably amongst the states. Whereas in case of tuberculosis prevalence rate i.e. 710 per 100,000 were in Assam and 8932 per 100,000 were in Tripura.

Table 4.4. Number of child household suffering from Diarrhea, Tuberculosis, Jaundice and Malaria in North-East States and India in NFHS-2

States	Asthama	Tuberculosis	Jaundice	Malaria
Arunachal Pradesh	3117	1270	1669	12619
Assam	3278	710	2768	2974
Manipur	2040	1107	1728	1995
Meghalaya	5995	1459	2658	16658
Mizoram	2149	1063	3155	7359
Tripura	2235	8932	4218	8869
Nagaland	5729	1654	5348	16166
Sikkim	4711	1002	2382	1108
India	2468	544	423	3697
Average for NE	3656.75	2149.625	2990.75	8468.6

Source: NFHS (1998-99), India.

In all the states in the NE Region, except Assam had a higher rate of tuberculosis disease but the 0-14 age group of child being observed over the time. In India, only 544 per 100,000 populations were suffering from tuberculosis. Similarly Jaundice is one of diseases most common in Nagaland which is 5348 out of 100,000 population are died only from it, whereas in Sikkim (2382) which is also much higher as compared to national average in India. Again it was observed that as per the NFHS report (1998-99) the occurrence of malaria also widely varied across the states, Children suffered from malaria was most often reported in Meghalaya followed by Nagaland, Arunachal Pradesh, and Madhya Pradesh whereas the prevalence of malaria is relatively lower in Sikkim as compared to the national average.

4.4. Vitamin A supplements for child in NE

Insufficiency of Vitamin A is one of the serious nutritional deficiencies in the universe. In each year more than 250 million of children are affecting throughout the world. At the age of 0-3 years children at high risk of vaccine preventable diseases and if children are already had a poor nutritional diet may have a negative impact on child's

overall development process .Therefore, the complete dose of vaccine and proper nutritional diet is essential for future development of a child.

Table 4.5 Vitamin A supplements for child age between (6-35) months in NE states (1998-2006)

States	Percentage of children age 6-35 months who had received vitamin A dose	
	NFHS (II) (1998-99)	NFHS (III) (2005-06)
Arunachal Pradesh	20.9	18.7
Assam	15.4	18.7
Manipur	38.4	15.2
Meghalaya	24.7	20.9
Mizoram	70.6	46.5
Nagaland	6.8	8.9
Tripura	-	41.2
Sikkim	45.8	24.2
Average for NER	27.8	24.2
India	29.7	24.8

Source: National family health survey 1998-99 to 2005-06

The 2nd and 3rd round NFHS data also provides the data on vitamin A supplements.The above mentioned table shows the percentage change in vitamin A supplementation for child in the NE states and India. Mizoram has received a highest percentage of vitamin A dose with 70.6% followed by Sikkim with 45.8% and Manipur with 38.4 % which are much higher than the national average 29.7% while the performance of Nagaland and Assam performance were not better on the basis of receiving a vitamin A nutrition's. Except Mizoram and Sikkim all other NE states were found to be backward in terms of vitamin A supplementation when compared with the national average level as per NFHS-II round data.

The NFHS III round data shows that there is a significant change in all NE states. Except Manipur and Nagaland performing well in receiving the vitamin A supplementation which is 41.2% and 8.9% respectively followed by Assam is 18.7%. While some of the states such as Arunachal Pradesh, Mizoram, Meghalaya, Sikkim, and Manipur performance was poor in receiving the vitamin A supplements. Thus the vitamin A supplements status of NE states from NFHS II and III rounds data shows that there is fall in nutritional distribution in most of the states which was even below the national average rate. Expect Nagaland, Tripura and Assam were performing well in terms of vitamins A supplements.

4.5. Status of health care infrastructure in NE and India

On the basis of analysis conducted with the help of time series data from (2004 to 2016) by using simple descriptive statistics, it indicates that on an average the total number of Sub-centers functioning was 47.09%, Primary health centers functioning was 26.18% and community health centers functioning was 16.27% over the year. On an average the progress rate of Tripura progress rate in terms of health care infrastructure (sub-centers) is better position as compared to other states. While Assam, Manipur, Meghalaya, Nagaland, and Mizoram were also have a better position in terms of sub-center infrastructure facility. Among eight NE states, on an average Sikkim has experiencing worse in sub-centers facility available followed by Arunachal Pradesh. Except Sikkim and Arunachal Pradesh, all other NE states were performing well in terms of sun-centers over the year. While in terms of primary health centers (PHC), Sikkim occupied first position against national average while Tripura was in second position followed by Assam, Manipur, Meghalaya, and Nagaland. It can be observe that the performance of Arunachal Pradesh performance was not well with regards to primary health centers also. On the basis of mean estimation value in terms of community health centers (CHCs), on an average Arunachal Pradesh were doing well while the performance of remaining states compared to national average was very poor. It has been observed that Sikkim stood in a least position in terms of community health centers during the study period.

Table 4.6 Descriptive statistics of health care infrastructure in NER and in India from (2004 to 2016)

States	Distractive statistics	Sub-centers	PHC	CHCs
Arunachal Pradesh	Mean	14.36	13.28	13.09
	Std.Deviation	36.25	36.26	72.14
	CAGR (%)	-99.95	-99.02	-98.95
Assam	Mean	47.09	26.18	11.45
	Std.Deviation	23.19	20.23	18.95
	CAGR (%)	-99.96	-99.13	-98.96
Manipur	Mean	42.27	23.45	16.27
	Std.Deviation	23.46	17.70	46
	CAGR (%)	-99.99	-99.15	-99.01
Meghalaya	Mean	40.36	23.15	16.27
	Std.Deviation	11.05	15.44	2.45
	CAGR (%)	-99.01	-99.11	-98.98
Nagaland	Mean	39.01	23.15	2.02
	Std.Deviation	1.09	15.98	0.02
	CAGR (%)	-99.01	-99.11	-98.98
Mizoram	Mean	36.54	19.54	9.01
	Std.Deviation	2.01	16.62	0.01
	CAGR (%)	-99.01	-99.15	-99.01
Tripura	Mean	69.81	31.36	12.09
	Std.Deviation	17.10	70.37	3.78
	CAGR (%)	-98.93	-99.14	-98.93
Sikkim	Mean	13.3	27.28	2.36
	Std.Deviation	33.48	61.03	1.50
	CAGR (%)	-99.06	-99.15	-99.06
India	Mean	147.3	353.01	26.45
	Std.Deviation	264.72	392.78	2.54
	CAGR (%)	-99.01	-98.81	-98.95

Source: computed and compiled from secondary data, Ministry of health and famiWelfare, Government of India.

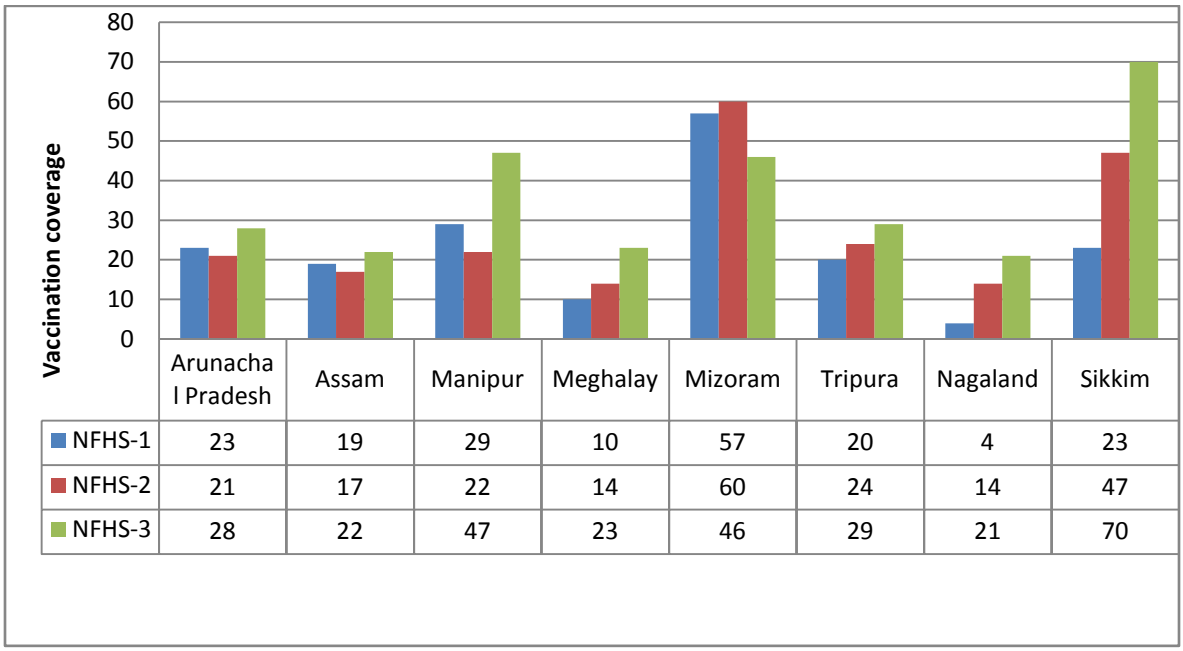
The above estimated Table 4.6 also shows the CAGR of three infrastructural facilities i.e. Sub-Centers, Primary Health Centers, and Community Health Centers during the year 2004 to 2015.

For primary estimation we have divided this chapter into three sections – descriptive statistics using univariate frequency distributions, followed by the same using Bi-variate frequency distributions, and ending with the analysis of the data using the multinomial logit model.

The present study employed the descriptive statistics in terms of frequency, percentage and cumulative frequency and also Bi-variate Frequency distribution table. Apart from this multinomial logit model has been used for understanding the significant effects of several socio-economic variables on child health through immunisation coverage in the east district of Sikkim.

Let us now consider the following figures such as Trends in full immunisation coverage (1992-2006), sources of childhood vaccination by residence, percentage distribution of education level between (15-49) years age grouped women (2005-06), and trend in women exposure to mass media from (1998-2006) etc.

Figure 4.1 Trends in Full Immunisation Coverage (1992-2006)

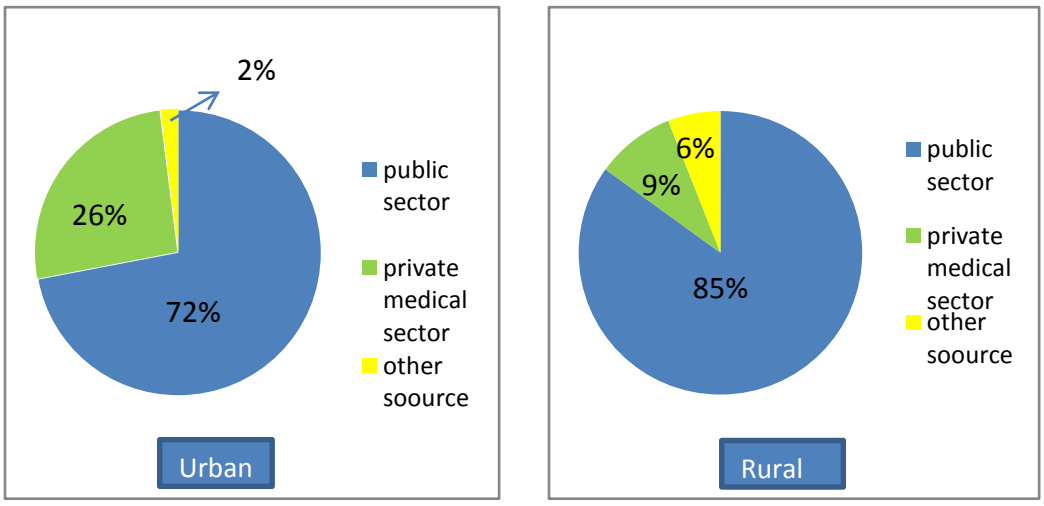


	Arunachal Pradesh	Assam	Manipur	Meghalay	Mizoram	Tripura	Nagaland	Sikkim
NFHS-1	23	19	29	10	57	20	4	23
NFHS-2	21	17	22	14	60	24	14	47
NFHS-3	28	22	47	23	46	29	21	70

Source: NFHS-1 (1992-93), NFHS-2 (1998-99), NFHS-3, (2005-06), India.

Refers to Figure 4.1, the trend in immunisation coverage among the NE states Sikkim has achieved steady growth in immunisation coverage over the year. In NFHS-1 (i.e. 1992-93), Sikkim 23 children were immunised per 100 new baby, whereas in phase-2 (i.e. 1998-99) state had in double of its immunisation coverage and subsequently the number of immunisation had increased by 204% in phase-3 (i.e. 2005-06) as compared to NFHS-1.

Figure 4.2 Sources of Childhood Vaccination by Residence



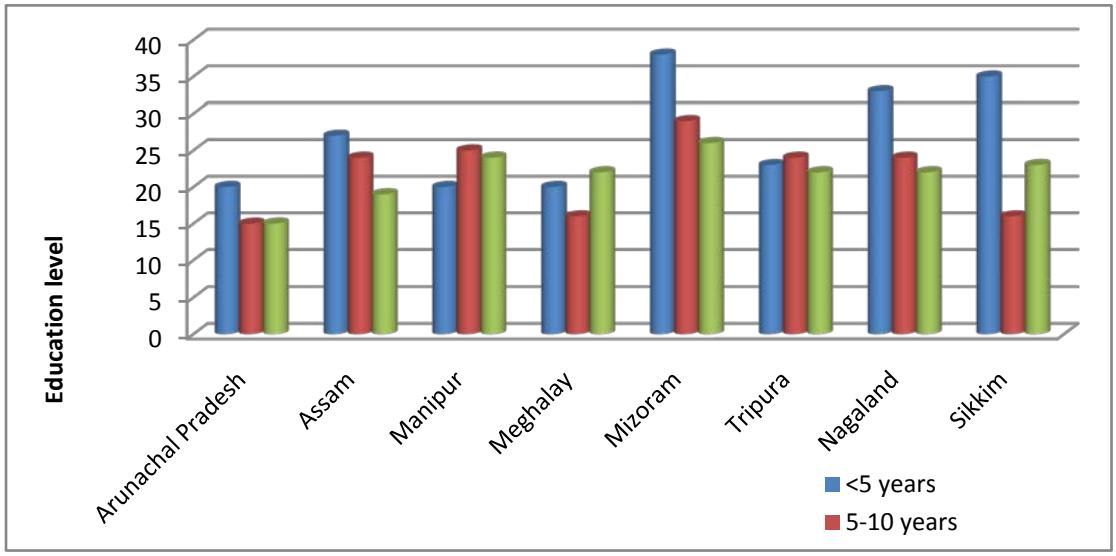
Source: NFHS-2, (1998-99), India.

Figure 4.2 shows the percentage distribution of vaccination sources from where the child are being immunised. In the rural areas the majority of the children were immunised in public sector, which was 85% while 9% of child were immunised from private medical sector whereas 6% was been immunised via the others sectors (i.e. NGOs). In urban areas 72% were immunised from the public sector and one fourth of the children were immunised in private medical sector and the role of other sector was almost negligible in urban area (i.e. only 2%). It is be observed from the figure that the percentage change of child receiving vaccinations from the private sector is considerably lower in rural areas (9%) compared with urban areas (24%). It may be linked with the children of more educated mother and those belonging to households with high standard of living were more likely to get vaccine from private sectors.

4.6. Status of Women Education Level in NE Region

Figure 4.3 shows that the percentage changes in distribution of education level between the (15-49) years age group women during (2005-06) amongst the NE states. In Sikkim, the percentage change in the educational level of women was just below 35% who had spent less than five years in school and exactly 15% of women has spent 5-10 years in schooling and 23% of the women has spend more than 10 years of schooling over the year (2005-06).

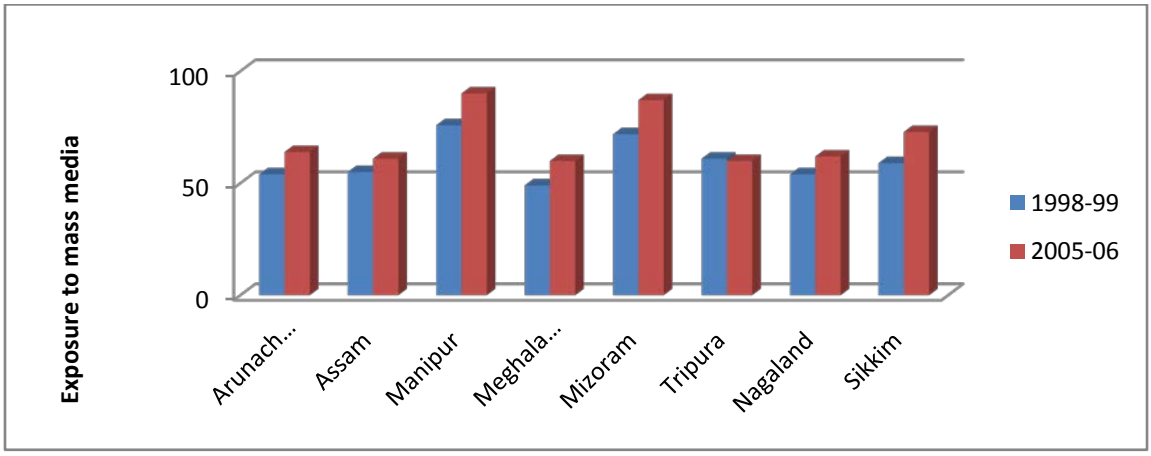
Figure 4.3 Percentage distribution of education level between (15-49 years) age grouped women (2005-06)



Source: NFHS-2 (1998-99), India

In a country like India where a large number of women's are illiterate or have a little formal education in such as the mass media can play a vital role in bringing about in modernization. Refer to Figure 4.4; in NHFS-3 more than 80% of women were regularly exposed to any mass media from Manipur which was highest amongst NE states followed by Mizoram and Sikkim.

Figure 4.4: Trend in women exposure to mass media from (1998-2006)



Source: NFHS (2005-06), India

However, in NFHS-2 again women of Manipur were more interested to engage in any mass media (i.e. 68%) followed by Mizoram and Tripura. Whereas Sikkim has achieved a just double exposure to mass media in this regards in third round (i.e. 73%) as compared to second round NFHS (i.e. 2005-06).

4.7. Description of Variables

Table 4.7. Variables Description

Sl.No	Variables Name	Description of the variables
1	IMMU	Immunisation: 0 for not being immunised, 1 for partially immunised, & 2 for fully immunised.
2	LOC	Location: 0 for rural, 1 for urban
3	Cast	SC/ST=0, OBC=1, others=2
4	ME	Mother's education: 0 for primary, 1 for secondary, & 2 for higher secondary and above.
5	MWS	Mother's working status: 0 for not working, 1 for working
6	EMM	Exposure to mass media: 0 for those who are not exposed to mass media, 1 for those who are exposed to mass media.
7	HC	Availability of Health card: 0 for non availability of health card, 1 for availability of health card
8	BOC	Birth order of child: 0 for first child, 1 for second child, 2 for 3 plus.
9	SOL	Standard of living: 0 for low, 1 for medium, & 2 for high.
10	Religion	0 for Hindu, 1 for Christian, & 2 for others.
11	Mage	Mother's age: 0 for (15-24), 1 for (25-35), & 2 for (35+).
12	SC	Sex of the child: 0 for female, 1 for male.

Let us consider the descriptive statistics of the variables in terms of different statistical tools which are as follows.

4.8. Descriptive Statistics of Variables in terms of Frequency Percentage Frequency and Cumulative Frequency

Table 4.8. Descriptive statistics on immunisation coverage

IMMU	Frequency	Percentage	Cumulative frequency
0	45	22.06	22.06
1	44	21.57	43.63
2	115	56.37	100.00
Total	204	100.00	-

Source: Author's calculation on primary data.

Table 4.9. Descriptive statistics on sex of the child

SC	Frequency	Percentage	Cumulative frequency
0	111	54.41	54.41
1	93	45.59	100.00
Total	204	100.00	-

Source: Author's calculation on primary data

Table 4.10. Descriptive statistics on birth order of child

BOC	Frequency	Percentage	Cumulative frequency
1	87	42.65	42.65
2	73	35.78	78.43
3	32	15.69	94.12
4	12	5.88	100.00
Total	204	100.00	-

Source: Author's calculation on primary data

Table 4.11. Descriptive statistics on standard of living

SOL	Frequency	percentage	Cumulative frequency
0	98	48.04	48.04
1	95	46.57	94.61
2	11	5.39	100.00
Total	204	100.00	-

Source: Author's calculation on primary data

Table 4.12. Descriptive statistics on caste

Caste	Frequency	Percentage	Cumulative frequency
0	69	33.82	77.45
1	64	31.37	91.67
2	71	34.80	100.00
Total	204	100.00	-

Source: Author's calculation on primary data

Table 4.13. Descriptive statistics on religion

Religion	Frequency	percentage	Cumulative frequency
0	158	77.45	77.45
1	29	14.22	91.67
2	17	8.33	100.00
Total	204	100.00	-

Source: Author's calculation on primary data

Table 4.14. Descriptive statistics on EMM

EMM	Frequency.	Percentage	Cumulative frequency
0	80	39.22	39.22
1	124	60.78	100.00
Total	204	100.00	-

Source: Author's calculation on primary data

Table 4.15. Descriptive statistics on working status of mother

MWS	frequency	percentage	Cumulative frequency
0	123	60.29	60.29
1	81	39.71	100.00
Total	204	100.00	-

Source: Author's calculation on primary

Table 4.16. Descriptive statistics on location (Rural / Urban)

Location	Frequency	Percentage	Cumulative frequency
0	102	50.00	50.00
1	102	50.00	100.00
Total	204	100.00	-

Source: Author's calculation on primary data

Table 4.17. Descriptive statistics on availability of health cards

HC	frequency	percentage	Cumulative frequency
0	42	20.59	20.59
1	162	79.41	100.00
Total	204	100.00	-

Source: Author's calculation on primary data.

From the table 4.9, it is clear that 45 respondents (i.e. 22% of total respondents of the sampled children) have not undergone any kind of immunisation. Partial immunisation has been observed in case of the children of 44 respondents (21%). More than half of the sample i.e., 115 respondents or (56%) have completed the immunisation process.

From table 4.10, we can observe that, 111 respondents (i.e. 54.41% of the total sample) have females as children whereas 93 respondents (i.e. 45.59% of sample) have males.Table 4.11 shows that 42.65% of the total respondents have only one child, whereas 35.78% have two children, 15.69% have three children and the rest i.e. 5.88% have four children.

From the table 4.12, it is clear that 98 respondents (i.e. 48.04%) are from low economic background families. On the other hand 95 respondents (i.e. 46.57%) are from middle class families and 11 respondents (i.e. 5.39%) belong to upper class family groups.

From table 4.13, it appears that 33.82% of the respondents belong to SC/ST category, 31.37% are belong are OBCs and the rest (i.e. 34.80%) are in the general category.

Observations from table 4.14, make it clear that more than half of the sample (i.e. 158) respondents are Hindu, only 29 respondents are Christians and the remaining 17 respondents belongs to other categories (i.e. Muslim, Jain, Shik etc).

Table 4.15, shows that more than half of the respondents i.e. 124 are familiar with the mass media whereas 80 respondents have not been exposed to them.

From the table 4.16, it is clear that 60.29% of the total respondents out of the 204 sampled are engaged in income earning activities, whereas 39.71% have not been engaged in any kind of income earning activity.

From table 4.17, we can see that out of 204 respondents half of the sample was collected from rural areas with the other half coming from urban areas.

From table 4.18, it is clear that 20.59% of the respondents do not have any health cards whereas almost 80% of them have health cards.

4.9. Descriptive Statistics of the socio-economic variables by using Bivariate frequency distribution table

Table 4.18. Bi-variate frequency distribution for immunisation coverage and birth order of child

IMMU	BOC				
	1	2	3	4	Total
0	14	20	8	3	45
1	25	8	7	4	44
2	48	45	17	5	115
Total	87	73	32	12	204
Chi-square value	10.0754 (***)				
df	6				

Source: Author's calculation on primary data.

Using the bivariate frequency distribution table we can observe the effects of different types of socio-economic variables on the distribution of immunisation coverage. From table 4.19, we can get an idea about the changes in the distribution of immunisation coverage as birth order of the child changes. In others words here we are interested to know whether distribution of immunisation coverage remains the same across the different birth orders of the children. However from the above table it is apparent that when birth order of child is one, 48 children out of 87 are fully immunised. On the other hand when the birth order changes from 1 to 4 only five children out of 12 have been fully immunised. From this result we can say that the distribution of immunisation coverage changes with the birth order of the child, which is again confirmed by the chi-square value; this chi-square value is significant at 12% level.

Table 4.19. Bi-variate frequency distribution for immunisation coverage and standard of living

IMMU	SOL			
	0	1	2	Total
0	12	12	21	45
1	10	16	18	44
2	47	36	32	115
Total	69	64	71	204
Chi-square value	7.6250 (**)			
df	4			

Source: Author's calculation on primary data

Similarly, from table 4.20, we can get an intuition regarding the changes in distribution of immunisation coverage as standard of living changes. We can clearly observe that out of 69 respondents 47 children who have been fully immunised belong to families from low economic background; in contrast 36 out of 64 respondents belonging to middle class family and 32 out of 71 coming from upper income class family have been fully immunised. Therefore from this result we can say that as the standard of living varies from 0 to 1 and from 1 to 2 (i.e. low to middle, middle to higher class) so, the distribution of immunisation coverage also varies within the entire group.

Table 4.20. Bi-variate frequency distribution for immunisation coverage and caste

IMMU	Caste			
	0	1	2	Total
0	12	12	21	45
1	10	16	18	44
2	47	36	32	115
Total	69	64	71	204
Chi-square value	8.5379 (***)			
df	4			

Source: Author's calculation on primary data

Table 4.21, relates to the effect of caste on distribution of immunisation coverage. The chi-square value also shows that caste has a significant effect on child immunisation coverage at 10% level with four degrees of freedom. 12 children out of the 69 sampled have not been received any kind of immunisation; they belong to families in SC/ST category. 12 out of 64 come from families in the OBC category and 21 out of 71 respondents in the general category have not been immunised at all. Thus as per the above result, the distribution of immunisation coverage changes with the change in caste from SC/ST to OBC and from OBC to general category.

Table 4.21. Bi-variate frequency distribution for immunisation coverage and religion

IMMU	Religion			
	0	1	2	Total
0	31	9	5	45
1	28	8	8	44
2	99	12	4	115
Total	158	29	17	204
Chi-square value	14.1107 (***)			
df	4			

Source: Author's calculation on primary data

We can see from the table 4.22, that the progress rate in distribution of immunisation coverage among the entire group differs according to religion. It is also clear that the rate of partial immunisation varies from one religion to another; out of 158 respondents 28 have undergone partial immunisations who are Hindus. But in case of other religions only 8 children have received partial immunisation, Thus the people from Hindu religions background are performing better in terms of partiall imunisation coverage compared to Christian and others religion categories respectively. Therefore we can also conform from the chi-square value that is found to statistically significant at 10% level

Table 4.22. Bi-variate frequency distribution for immunisation coverage and Mother's working status

IMMU	MWS		
	0	1	Total
0	29	16	45
1	31	13	44
2	63	52	115
Total	123	81	204
Chi-square value	3.6803(***)		
df	2		

Source: Author's calculation on primary data

In table 4.23, we are interested to know whether the changes in mother are working status has a significant effect on the distribution of child immunisation coverage. It appears from this table that for more than half of the sample, mothers are not engaged in any income earning activity; 63 children out of 123 have been fully immunised. In case of working mothers 52 children out of 81 have been fully immunised.

Table 4.23. Bi-variate frequency distribution for immunisation coverage and availability of health cards

IMMU	HC		
	0	1	Total
0	16	29	45
1	12	32	44
2	14	101	115
Total	42	162	204
Chi-square value	12.3484 (**)		
df	2		

Source: Author's calculation on primary data

Table 4.24, shows the impact of health cards on distribution of immunisation coverage. More than half of the children (i.e. 101) out of 162 who have received any kind of immunisation fully are health card holders, whereas 32 are partially immunised and only 29 children out of 162 have not been immunised at all. It is also clear from the above table that improvement in distribution of immunisation coverage among who do not have health cards is relatively less. Thus the possession of health cards also has a significant effect on child immunisation coverage.

Table 4.24. Bi-variate frequency distribution for immunisation coverage based on sex of the child

IMMU	**SC**		
	0	1	Total
0	26	19	45
1	25	19	44
2	60	55	115
Total	111	93	204
Chi-square		0.5404	
Df		2	

Source: Author's calculation on primary data.

It is clear from the table 4.25, that out of 111 female children, 26 have not been immunised, whereas out of 93 male children only 19 have not received any immunisation. In other words the percentage of no immunisation is better for the male child compared to the female child. Similarly there is also variation in partial and full immunisation coverage with the sex of the child.

Table 4.25. Bi-variate frequency distribution for immunisation coverage and Location

IMMU	Location		
	0	1	Total
0	37	8	45
1	17	27	44
2	48	67	115
Total	102	102	204
Chi-square value	24.1007 (*)		
df	2		

Source: Author's calculation on primary data

According to table 4.26, it is found that among the rural children, 37 children out of 102 missed any kind of immunisation, 17 children were partially immunised, whereas 48 children are fully immunised. On the other hand, in case of children from urban locations, the rate of full immunisation is quite higher here at 67, more than 26 were partially immunised and rate of no immunisation coverage was lowest here with only 8 out of 102 respondents. This can be again confirmed from the chi-square value which is found to significant at 1% level with two degrees of freedom.

Table 4.26. Bi-variate frequency distribution of immunisation coverage and exposure to mass media

IMMU	EMM		
	0	1	Total
0	17	28	45
1	20	24	44
2	43	72	115
Total	80	124	204
Chi-square value	0.9181		
Df	2		

Source: Author's calculation on primary data.

From the table 4.27, it is apparent that 72 children out of 124 are being fully immunised are familiar through engagement with mass media, while for those who are not exposed to mass media only 43 children out of 80 are fully immunised. In case of partially immunisation, 24 out 124 had been immunised through familiarity with mass media, whereas in the other category 20 out of 80 were immunized. From this result we can say that the distribution of immunisation coverage varies with exposure to mass media.

4.10. Result and Analysis of probability of child immunization coverage in East Sikkim by multinomial logit model

$$IMMU_i = \beta_0 + \beta_1 SC_i + \beta_2 LOC_i + \beta_3 BOC_i + \beta_4 Mage_i + \beta_5 ME_i + \beta_6 SOL_i + \beta_7 Cast_i + \beta_8 Religion_i + \beta_9 EMM_i + \beta_{10} MWS_i + \beta_{11} HC_i + u_i \ldots\ldots\ldots\ldots (1)$$

In order to understand the effects of socio-economic and demographic factors on immunization coverage multinomial logit regression is used for East Sikkim after considering the nature of i.e. immunisation coverage which has been divided into three categories i.e. full immunisation, partial immunisation and no immunisation.

It is seen from the above table that out of the 11 variables, 5 are found to be statistically significant. Boc, Mage, Sol, Caste and Religion; others are found to be statistically insignificant. In order to understandthe effects of socio-economic and demographic factors on immunization coverage multinomial logit regression is used for East Sikkim after considering the nature of i.e. immunisation coverage which has been divided into three categories i.e. full immunisation, partial immunisation and no immunisation.

Table 4.27. Factors Affecting Child Immunisation in Sikkim

Explanatory Variables	Order	Coefficients
Sex of the child	1	0.030 (0.05)
Birth order of child	2	-0.806*** (-1.42)
	3	0.315 (0.45)
	4	0.826 (0.85)
Mother Age	1	1.581*** (-2.74)
	2	-1.890** (-2.33)
Location	1	0.433 (0.82)
Mother Education	1	-0.071 (-0.12)
	2	0.493 (0.61)
Standard of living	1	0.068*** (-1.48)
	2	-13.78 (-0.02)
Cast	1	1.026*** (1.85)
	2	0.976*** (1.68)
Religion	1	0.682 (1.19)
	2	1.37*** (1.54)
Exposure to mass media	1	0.290

		(0.47)
Mother working status	1	-0.481 (-0.98)
Health card	1	-0.649 (-1.10)
Constant	-	0.089
No. of variables	-	204
LR chi^2	-	102.47
Pseudo R^2	-	0.2544

Note: *, NoteNote: *, **, and *** shows the 1%, 5%, and 10% level of significance
Figure within the brackets represent the Z statistics value

In order to understand the effects of socio-economic and demographic factors on immunization coverage multinomial logit regression is used for East Sikkim after considering the nature of variable i.e. immunisation coverage which has been divided into three categories i.e. full immunisation, partial immunisation and no immunisation.

It is seen from the above table that out of the 11 variables, 5 are found to be statistically significant: Boc, Mage, Sol, Caste and Religion; others are found to be statistically insignificant.

From the above table we can observe that the estimated slope coefficient on birth order of child is statistically significant. The negative slope coefficient of birth order the child suggests that the odds in favor of immunisation decreases by 0.5 units for second child, holding others variables constant.

The coefficient of mother's age is positive for a Mage value of 1 (i.e., age group of 25 to 35 years) and negative for a value of 2 (i.e. age group of 35+). This is not unexpected, since it suggests that at younger ages, mothers are more keen to ensure the health of their children. However with the advancement of age, there is a decrease in this tendency.

In case of medium standard of living the coefficient is found to be negative and significant. This suggests that for those with this standard of living there will be less tendency to get the children immunized, which is difficult to explain or justify.

The coefficient is positive and significant for both values of caste, which indicates that the trend towards immunisation will be higher for OBCs and those from the general caste. Another way of looking it is that people from an SC/ST background will have less urge for immunisation.

As far as religion is concerned, the coefficient is found to be positive and significant for other religions, thus suggesting that followers of such religions will have a greater tendency for getting their children immunised.

As per the immunization schedule provided by the District hospital of Sikkim that each child or infant should provide the following vaccine at the age 5 years like

(i) Two dose of TT vaccine =(i.e. TT-1 for early in pregnancy, & TT-2 after 4 week of TT-1)
(ii) One dose of BCG = at birth or up to 1 year.
(iii) Four dose of OPV = (i.e. OPV-0 at birth or can be given up to 2 weeks, OPV-1,2 and 3 at age 10 to 14 weeks but can be given up to 5 years)
(iv) Three dose of DPT = (i.e. DPT-1,2,& 3 at age 6, 10 & 14 but can be given up to 2 years)
(v) One measles vaccine = (given at 9-12 months)
(vi) Vitamin-A = (At 9 months)

In this connection it is to be mentioned that, those children who had received a two doses of TT vaccine, one doses of BCG, three doses of DPT, four doses of OPV, one measles vaccine, and one dose of vitamin A/booster has been considered as a full immunized children. Likewise children who had received at least three doses of vaccine from the entire dose are considered as Partially immunised children. Those children who did not received a single vaccine from the entire dose mentioned above come under the no immunisation coverage.

At an overall level the LR Chi square value (36) is quite high and its probability value is very small for all the categories, indicating that the model is a very good fit.

Chapter - 5

Conclusion Observation and Policy Prescriptions

5.1 Conclusion

Survival is the core of every nation. Long term survival of a nation necessitates being strong in terms of health as well as wealth, i.e., economic well-being. Generally however the focus is shifted away from health because of supposedly more important issues like the environment, socio-economic aspects, demographics, etc. Child health encompasses complete physical, mental, emotional and social well being of the child. Researchers and policy makers are investigating the main causes of the problems and are also trying to bring it to the attention of the government. The present study was based on micro level study for analysing and investigating the problems associated with child health. Socio-economic problems of the parents and environmental conditions play a crucial role in ensuring the good health of the child.

The present study has used a secondary data mainly from National Health Family Survey sources to know the child health care system in North-East (viz Arunachal Pradesh, Assam, Tripura, Meghalaya, Manipur, Nagaland, Mizoram, and Sikkim) in general and Sikkim in particular. Thus the simple descriptive statistics and CAGR analysis for the period (1992-2006) has been used to examine the health care system in the North-East.

As per the findings of the study, the percentage change in full immunisation coverage is relatively high in Sikkim, second only to Nagaland.

While in terms of socio-economic factors like mother education, among the eight north east states, Mizoram is doing well in terms of women education level. Percentage change in women's education level in Sikkim is relatively less across all the categories as compared to Mizoram. As per the results obtained from CAGR the trend in diseases caused increased in all most all the states compared to the nation average over the period 1998-99.

The general view emerging from the study was that the problems encountered in ensuring child health originated both from socio-economic issues as well as environmental factors. However in rural areas most people are unable to take advantage of the healthcare system due to the expenses involved; lack of awareness of the people is also an issue. The condition of government hospitals is very pathetic with a poor management system. With poor people avoiding treatments in government hospitals there is further decline in the health of the people. In such a situation it is natural that the health of children is a major casualty.

A perusal of the descriptive statistics shows that more than half of the respondents have had their children fully immunised. However there is a significant proportion whose children have been only partially immunised, or even with no immunization at all, with almost equal numbers of people in both.

Coming to the number of children, the highest proportions are in favor of one or two child families, with the percentages progressively falling downwards for higher number of children.

Urban children have better immunisation coverage than rural children, possibly because of better accessibility to health care facilities. With reference to caste the trend of immunisation coverage is higher in favor of OBC and general category, the percentage change in immunisation being higher for both the categories.

Coming to mother's education level, immunisation coverage is twice more for mothers with more than 10 years of schooling as compared to those who have less than 5 or less years of schooling. Immunisation coverage varied substantially with socio-economic status of household; while, the lower coverage of full immunisation among the children of Hindu religion is probably because of some parents' mistaken belief about the ill effects of vaccination or in connection with religions faith. Beside the socio-economic factors, possession of health card is also significantly associated with full immunisation coverage in Sikkim.

In the view of the some experienced or knowledgeable respondents from the selected areas the facilities available in rural areas are not sufficient for achieving a good health

for the child. There is also a lack of awareness regarding available vaccines as more than half of the mothers only know the OPV vaccine. Religious beliefs and availability of financial support also impact the health of the child. As per the above-mentioned respondents some people are engaged in day to day work for fulfilling their children's needs as well as to protect them from diseases which ironically results in less time devoted to their children.

As per the preceding findings the major factors leading to a child not being immunised has often been found to be the mother's age, mother's education as well as income of the parents. In general as the mother gets older she has a lower tendency towards getting the child immunised. Again, with the higher education level of the mother the greater will be the chance of the children being immunised, which was confirmed from the observations in our study. During our study women in both the areas admitted that they were more aware about child healthcare and all medical facilities are available in the respective health centers which was not so in earlier times. Both pre-natal and post-natal care is followed. During pregnancy they have to take all required medicines and vaccination, while after birth they take their child for immunisation.

In earlier times women had to face many problems in immunizing their children but now health centers have opened even in villages which monitor immunisation of every child on time. Presence of PHCs in the villages has led to the decrease in death rates during delivery. Advancements in the field of medicine and steps taken by the government towards healthcare like immunisation and others medical facilities provided on time have led to a decrease in the rate of polio and disabilities among children.

In general, the healthcare system has now improved in all almost all parts of Sikkim with regard to child health problems like TT1, TT2 during pregnancy and diseases like BCG, DPT, and measles etc which were not available earlier. Urban children had better immunisation coverage than rural children probably because of better accessibility and the success of supply side factors.

5.2 Policy and Prescriptions

Based on the findings, we would like to highlight certain implications for the improvement of the child healthcare system in various places of Sikkim as well as for the betterment of upcoming generation. Some suggestions regarding these issues (with reference to child health care) are as follows.

- Improvement in quality of health care services, health infrastructure, health workforce, and nutritional diet, etc. helps to reduce infant and maternal mortality rate, while improvement in the quality of life helps to reduce fertility control and population stabilisation.
- Village level health workers should increase the frequency of door to door interaction with the people, specially with mothers; health care providers should conduct the ward, Panchayat and block levels awareness programmes and medical campaigns in every district of Sikkim.
- Generally, the awareness of most of the respondents is limited to polio vaccine; hence there is a need for awareness campaigns. The health departments should also enquired about the reasons for the careless attitude of the health workers whose sole responsibility is to sensitise people about the different types of vaccination schemes.
- All the health workers (like medical staff, nurses, in-charges, medical officers, attendants etc.) should strengthen their leadership abilities so as to run the respective institutions properly. Training facilities should provide to all the workers as most of them have not received such training.
- Illiteracy is one of the reasons for people lagging behind in terms of awareness level. In order to improve the awareness level regarding child health among the citizens of Sikkim, education should be given topmost priority.
- While establishing health clinics or health centers, the government should look to keep in mind factors like population size as well as distance.

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Appendix

Questionnaire

1. Location: □Rural □Urban Name of the village: _____
2. GPU: _____
3. Block: _____

4. Name of the Respondent : _____
5. Gender : □Male □Female
6. Age (in years): _____
7. Religion :

i.	Hindu
ii.	Christian
iii.	Others

8. Cast:

i.	SC/ST
ii.	OBC
iii.	General

Questioner related to mother health

7. Mother's education (year of schooling): ___
8. Exposure to mass media: yes/no
9. Working status of mother: yes/no

i.	Govt
ii.	Private
iii.	Self employment
iv.	Other (specify)

10. Anti-natal care check up :Yes/No
11. Do you receive health card? Yes/No
12. Age of mother: _____
13. Standard of living:

0.	Low
i.	Medium
ii.	High

Details of the household Member:

Total no of children	Relation with household head	Sex of child	Age of child	Education background

14. Total number of room available: _____
15. Total number of family member: _____
17. Total number of working member: _____
18. Gender of household head: _____

19 Education levels of household head: _____

20. Family status: APL / BPL

21. Occupation of household head:

i. Govt
ii. Private
iii Farmer
iv.Businessman
v.Other (specify)

Monthly Expenditure Details on dietary food

Sl.no	Items	Expenditure
1	Green vegetables	
2	Eggs, milk, meat	
3	Fruits, edible oils, spices etc	
4	Junk food	
5	Medical	
6	Clean and hygienic	
7	Education	

22. Family monthly consumption expenditure: _____

23. Total income of the family: _____

24. Income of the head of the family: _____

Question Related to the child village

25. Water facility available in your home? Yes/No

26. Toilet facility available in your home? Yes/No

27. Do you have your own house? Yes/No

□ Kutccha house □ Pukka house

28. What kind of fuel is used for cooking purpose?

i. Gas
ii. Wood
iii. Charcoal
Iv other

29. Tick if this is available near to your home:

i. PHC
ii. CHCs
iii. Sub-centres
iv .private clinic

Note: if the above mention items is not available near to village

30. Is your home accessible to road? Yes / No

If yes: □ pukka road □ Kuchha road

31. Tick whichever is available: □Bus service □Service vehicles □Taxi □All

Question Related to Child health

32. Birth order of the child:

i.	1st
ii.	2nd
iii.	3rd
iv.	4th

33. Weight of the child:

i.	2-3 kg
ii.	4 kg
iii.	5kg +

34. Breast feeding of child: Yes / No

If yes: Duration of breastfeeding

35. Birth place of child: i. □ Hospital ii. □Home

36. Which hospital: i. □Government ii. □Private

37. Distance from hospital: _____

38. How many time did you visit to doctors in a month _____

39. Did he / she is immunized: □Yes . □No

	If yes:
i.	Full immunize
ii.	Partial immunize
iii.	No immunize

40. Do you have an idea about to wash hand before and after food? Yes / No

41. How many times you take a bath in a week? _____

42. What types of diseases causes a child health more?

	i.	Fever
	ii.	Diheorriea
	iii.	Malaria
	iv.	Typhoid
	v.	Any Other specify

43. Reason for causing diseases