CHAPTER – 1

CHAPTER - 1

INTRODUCTION AND RESEARCH METHODOLOGY

1.1 Introduction

Health is a crucial factor that plays a vital role in socio-economic development. Development of a community in particular and nation as whole depends largely on the health status. Healthy persons can benefit the society in many ways, as health has many types of positive externalities. The supply of labour in an economy is largely affected by the health status of the work-force. Moreover, good health condition avoids the irregularities or absenteeism from productive activities. According to Amartya Sen (2014)[1], health care is not something that is supported by economic growth but it is something that supports economic growth. Similarly, Geramano Mwabu (2007)[2] pointed out that good health is a determinant of economic growth and a component of well-being. He discussed and synthesised economic models of individual and household behavior how they may be used to illuminate health policy making in low-income countries. He addressed in his models "the questions such as: How can the health of the poor be improved, and what are the economic consequences of better health? What policies would improve intra-household distribution of health outcomes? An extensive literature on health, human capital and household models and his related field experiments, it is found that there are large returns to health improvements in low-income countries. Further, it has been highlighted that health improvements in poor nations can be achieved through implementation of simple interventions such as dietary supplements, control of parasitic diseases, and pro-poor social expenditures".

Hence, good health is a prerequisite to human productivity and the development process. A healthy community is the infrastructure upon which an economically viable society can be built. Thus, good health enhances the productivity of human capital for contributing optimally in the process of development. Empirical studies have shown that systematic healthcare initiatives

raised labour productivity; improved life expectancy, and significantly enhanced living standards. Thus, health is an intrinsic factor that plays a vital role in socio-economic development of a nation. The health of a population significantly depends on accessibility, availability and affordability of the healthcare services in one hand and on the other hand importantly depends on healthcare infrastructure particularly – physical and manpower associated with health delivery system.

Improvement in health status can be achieved through improving accessibility and utilisation of Health services (i.e., preventive and curative), Family Welfare and Nutrition Services, with special focus on underserved and poorer segments of the population. Health care should be accessible to every citizen and accordingly government has introduced and implemented various health schemes and programmes at different point of situation to provide basic health facilities to all citizens.

Thus, Primary Health care facilities are being one of the important social infrastructures required for the development of a community; thereby it has been drawing attention of the policy makers and well wishers universally with the objective of attaining of health for all. Development process largely depends upon the health status of human resource of an economy. Hence, it is necessary for building efficient capabilities of an individual to convert into human capital which is an essential factor of entire production process for development of a community or a nation.

In 1977, on the recommendation of the Srivastava Committee (1975)[3], the Government of India launched a Rural Health Scheme, based on the principle of "placing people's health in people's hands". It is a three tier system of health care delivery in rural areas. In 1978, India became a signatory to the Alma- Ata Declaration and had committed to attaining "Health for all" by 2000 A.D. through the Primary Health care approach.

The National Health Policy (NHP) in light of the Directive Principles of the constitution of India recommends "universal, comprehensive primary health

care services which are relevant to the actual needs and priorities of the community at a cost which people can afford" (MoHFW, 1983). The National Rural Health Mission (NRHM) also was launched in 2005 to provide health care service for all to 18 states that includes Assam. The National Rural Health Mission seeks to provide effective healthcare to rural population with special focus which have weak public health indicators and/or weak infrastructure.

1.2 Historical Background of Primary Health Care

At Alma-Ata in 1978, primary health care was thought to be the pathway to ensuring the health for all. It is true that the majority of the population in developing countries, particularly in rural areas, rely on primary health care systems to meet their health needs. It is also true that many illnesses that causes to death and disability in developing countries can be prevented, cured, or the severity of their effects reduced by using cost-effective essential medicines. As a result, it is important that essential medicines are available at primary level of health care.

Perceptions and knowledge of primary care have changed over time. Primary care was mainly concerned with the first-hand medical care (Hetzel, 1978). This approach was simple to comprehend, as it only addressed one aspect of people's medical access while they are require for it. The goal of primary health care has adopted an expansive framework that is intended to integrate a holistic approach of complete wellbeing of mankind.

According to the then Director General of the WHO (1975) “Primary health care is taken to mean a health approach which integrates at the community level all the elements necessary to make an impact upon the health status of the people. Such an approach should be an integral part of the national healthcare system. It is an expression or response to the fundamental human needs of how can a person know of, and be assisted in the actions required to live healthy life, and where can a person go if he/she needs relief from pain or suffering. A

response to such needs must be a series of simple and effective measures in terms of cost, technique and organisation, which are easily accessible to the people in need and which assist in improving the living conditions of individuals, families and communities. These include preventative, promotive, curative and rehabilitative health measures and community development activities".

The concept of primary health care has progressed from as first contact point for accessing healthcare to a holistic community development agenda at the community level. The perception of 'primary health care' varies greatly between the developed and developing countries. It is widely accepted in most developed countries that primary health care encompasses a wide range of services that may seem expensive or unachievable to developing countries. As per the Alma Ata International Conference (1978), Primary health care is defined as an essential health care based on practical, scientifically sound and socially suitable methods and technology made universally accessible to individuals and families in the community through their full participation and at a cost that the community and country can afford to maintain at every stage of their growth in the spirit of self-reliance and self determination. It forms an integral part both of the country's health system, of which it is the central function and main focus and of the overall social and economic development of the community. It is the first level of contact of individuals, the family and community with the national health system bringing health care as close as possible to where people live and work, and constitutes the first element of a continuing health care process.

The contents of Primary Health Care are described by WHO document (1978) as follows:

(i) Reflects and evolves from the economic conditions and socio-cultural and political characteristics of the country and its communities and is based on the application of the relevant results of social, bio-medical and health services research and public health experience.

(ii) Addresses the main health problems in the community, providing promotive, preventive, curative and rehabilitative services accordingly; The Alma Ata Includes at least; education concerning prevailing health problems and the methods of preventing and controlling them; promotion of food supply and proper nutrition; an adequate supply of safe water and basic sanitation; maternal and child health care, including family planning; immunisation against the major infectious diseases; prevention and control of locally endemic diseases; appropriate treatment of common diseases and injuries; and provision of essential drugs;

(iii) Involves, in addition to the health sector, all related sectors and aspects of national and community development, in particular agriculture, animal husbandry, food industry, education, housing, public works, communications and other sectors; and demands the co-coordinated efforts of all those sectors.

Sustainable Development Goals is decided as new global Goals 17 by United Nations Organisation in September 2015 on its 78th anniversary. As per the Sustainable Development Goal-3 which "ensure healthy lives and promoting well-being for all at all ages". The associated targets aim to reduce the global maternal mortality ratio; end preventable deaths of newborns and children; end the epidemics of AIDS, tuberculosis, malaria and other communicable diseases; reduce mortality from non-communicable diseases; strengthen the prevention and treatment of substance abuse; halve the number of deaths and injuries from road traffic accidents; ensure universal access to sexual and reproductive health-care services; achieve universal health coverage; and reduce the number of deaths and illnesses from hazardous chemicals and pollution (Transforming our world: the 2030 Agenda for Sustainable Development, 2015)[4].

1.3 Primary Health Care in India

Primary Health Care is a pivotal strategy that remains the backbone of health service delivery. Since, Ayurveda has been followed in India for over thousands of years hence the primary health care in India has been practiced from long back. It is to be mentioned that India was one of the first countries to support the advantage of Primary Health Care Approach. Primary Health Care was conceptualised in 1946, three decades before the Alma Ata declaration, when Sir Joseph Bhore made recommendations which formed the basis for organisation of basic health services in India. The Bhore Committee (1946)[5] report laid emphasis on social orientation of medical practice and a high level of public participation. The salient features of this committee are presented below.

(i) Integration of preventive and curative services at all administrative levels.

(ii) Short Term- Primary Health Centres for 40,000 population.

(iii) Long Term (Three million Plans) - Primary Health Centres with 75 beds for each 10,000-20000 population.

(iv) Formation of Village Health Committee.

(v) Provision of Social Doctor.

(vi) Inter-sectoral approach to health services development.

(vii) Training for Three months in preventive and social medicine to prepare social physicians.

As per the submission of Bhore Committee report, Mudaliar Committee was appointed to review the progress of India's health sector by the end of the second five-year plan (1956-61). The main recommendation by this committee was to limit the size of population served by primary health centres to 40,000, with the improvement in the quality of health care provided by these centres. It was also recommended that provision of one primary health worker per 10,000 populations.

The Jungalwalla Committee, (1967)[6] placed great emphasis on integrated health services. An integrated health service is defined as "a service with a unified approach for all problems instead of a segmented approach for all different problems". To put it simply, the committee recommended integrating all services from the top to the bottom, organisation and personnel.

The Kartar Singh Committee[7] on multipurpose workers in 1973 prescribed norms. The committee recommends the establishment of one primary health care centre for every 50,000 people. Each primary health centre will be broken down into 16 sub-centers, each serving a population of 3,000 to 3,500 people. Each sub-centre will be manned by a team of two health workers, one male and one female. One health assistant would supervise the work of 3-4 health nurses.

In 1975, the Srivastav Committee on Medical Education and Support Manpower proposed the formation of bands of community-based para-professional and semi-professional health employees (e.g., school teachers, post masters etc.). It also suggested that a "Referral Service Complex" be developed by developing links between primary health centres and higher-level referral and service centres, such as taluka/tehsil, district, regional and medical college hospitals.

Alma-Ata Declaration signed in 1978 by more than 130 nations and 68 organisations, including India launched the concept of Health for All strategy that provision for medical care of first contact services point and basic medical care within the framework of integrated health services.

For the rural health system, a three-tier system has been developed to provide health services at each level of the health center with standard norms for population coverage[8]. These are presented below-

Sub Centre (SC): Sub Centre is health care institution which is most peripheral contact point between the primary health care system and the community that serving 3,000 (Hilly/Tribal/Difficult Area) and 5,000(Plain area) population. Each Sub-Centre is manned by one Auxiliary Nurse Midwife (ANM) and one Male Health Worker/ MPW (M). One Lady Health Worker (LHV) is entrusted with the task of supervision of six Sub-Centres. The Sub- Centres are provided with basic drugs for minor ailments needed for taking care of essential health needs of men, women and children.

Primary Health Centre (PHC): Primary Health Centre (PHC) is the first contact point between village community and the Medical Officer. The PHCs were envisaged to provide an integrated curative and preventive health care to the rural population with emphasis on preventive and promotive aspects of health care. The PHCs are established and maintained by the State Governments under the Minimum Needs Programme (MNP) or Basic Minimum Services Programme (BMS). As per IPHS (2012), Primary Health Centre (PHC) is a 4-6 bedded hospital and referral unit for 6 Sub Centres with at least one Medical Officer and supported by 14 paramedical and other staff. The PHC covers 20,000 populations in hilly/tribal/difficult area and 30,000 in plain area acts as a referral unit for 6 sub-centres and refer out cases to CHC (30 bedded hospital) and higher order public hospitals located at sub-district and district level. It is occupying a place between a Sub-Centre at the most peripheral level and Community Health Centre at block level. The activities of PHC involve curative, preventive, promotive and Family Welfare Services.

Community Health Centre (CHC): Community Health Centre (CHC) is 30 bedded hospitals; provide specialised healthcare services to people in rural areas and acts as a referral centre for usually 4 PHCs for such patients who seek

modern healthcare treatment in the areas of medicine, surgery, paediatrics and gynaecology with X-ray and laboratory facilities. It covers a population of 80,000 (Hilly/Tribal/Difficult Area) to 1,20,000 (Plain area).

1.4 Significance of the Study

The enjoyment of the highest standards of health is one of the fundamental rights of every human being without distinction of race, religion, political belief and economic and social condition (Preamble of the WHO Constitution).Thus, deprivation of health care may be interpreted as a compromise to 'right to healthy life'. It is a fact that accessible and affordable health care is still a mirage to many of our people. The position has not undergone any significant improvement, even after completing more than 50 years of governance since independence (Joga Rao, 2005).Whereas, the status of the health centres in particular and the healthcare delivery system in general can be understood by the level of utilisation of healthcare services.

In fact, the utilisation of health services is determined by a number of factors like socio-economic status, age, gender, accessibility of healthcare centres, perceptions of quality service, belief in effectiveness of health centres. The initial behavior model of Andersen (1960s) was an attempt to study of why a family uses health services. He suggested that people's use of health service is a function of their predisposition to use services, factors which enables or impede use and their need for care. All those factors are influencing health care seeking and the choice of health care.

Assam is one of the 35 states and union territories of India. The total geographical area of the state is 78,438 sq. km. with a total population of 3.12 crore. Assam is primarily a rural state with more than 98% of its area falling under rural areas and a rural population of 86%. The state accounts for about 2.4% of the total geographical area and 2.6% of the total population of the country (Census, 2011).

Evaluation Study on National Rural Health Mission (NRHM) in Seven States by Programme Evaluation Organisation (Planning Commission, Government of India, 2011)[9] reveals that Quality and Outreach of the Health Services in the State has improved on several accounts. Thus, Assam has acclaimed that the rural health services has a better status amongst States with the implementation of National Rural Health Mission in the country. However, it is also fact that there are many issues on disparity in terms with distribution of public primary healthcare service delivery and utilisation in the state of Assam.

Despites the various initiatives of governments for improving the health delivery care system, the facts and figures of earlier studies have envisaged that the healthcare infrastructure in the state and nation is far from satisfactory level. The Indian Council of Medical Research study (1991) on Health facilities found that most PHCs are overburdened, accessible only to a few, and regional variations in area coverage. Apart from this, PHCs face the phenomena of inadequate drugs and medicine supply, poorly equipped treatment facilities etc. In his study, Rao (2005)[10] revealed that accessible and affordable health care is still a mirage to many people. The situation has not undergone any significant improvement, even after completing more than 50 years of governance since independence. Bala (2009) shown in his study that health care is not available to most tribal people due to lack of accessibility to health facilities, non-availability of health staff in the health centres, quality of services, and traditional practices and superstitions. Buragohain (2015)[11] observed that the health status among the rural population of Assam is not at all satisfactory.

It has been observed that the utilisation of services at Primary Health Centres (PHCs) by the community differs from place to place and changes over the time based on the availability of quality of services. Variations in utilisation rates of health services between different groups in society indicate inequity in access to public health care services. Such inequities originate from observable access barriers such as distance and price, as well as from more subtle, cultural

barriers such as lack of female autonomy and control over household resources (Ylva Kalin, 2011)[12].

Although in tribal areas the government has provisioned for the establishment of a primary health centre for every 20,000 population and a sub-centers for every 3,000 population, however, health care is not available to the majority of the tribal due to several factors such as lack of accessibility to health facilities, non-availability of health staff in the health centers, quality of services, traditional practices and superstitions (Bala et al., 2009)[13].

In fact, many of rural and tribal areas of Assam, the public health care system is surrounded by the basic phenomena like; lack of physical infrastructure, shortage of manpower (specialist/trained doctors), absenteeism among the health workers, irregular supply of drugs etc. Many of the rural areas are facing with the problems of accessibility of health centres on the one hand and availability of health services on the other. It is observed that there are low level of utilisation of general medical care services and laboratory services available in Primary Health Centres. Further, differences in the level of utilisation also exist among the different communities in the state. Comparatively, there is a lower level utilisation of primary health care services among the Bodos. This study attempted to bring out the facts about the public health care facilities, the extent of utilisation of healthcare services provided especially by the Primary Health Centres and the factors affecting the utilisation of primary healthcare services in Bodo community of Baksa district in Assam.

Empirical studies conducted in the past have shown that systematic healthcare initiatives have raised labour productivity; improved life expectancy and significantly enhanced the standard of living. Thus, the health care largely affects the socio- economic development of a community. Hence, it is necessary to bring out the issues relating to the health infrastructures and the utilisation of healthcare services of PHCs of the newly created Baksa district of Assam. The findings of this study may be helpful to the policy makers for improving the

health care delivery system, raising the utilisation and effectiveness of public health centres, if any deficiency exists. The study may become the source of further research.

1.5 Rationale for Selection of the Study Area

The Bodoland Territorial Areas District (BTAD) in Assam has been formed under the 6th Schedule of Indian Constitution through an accord in 2003. Baksa district is one of the four districts of BTAD in Assam. It is recently created district which came into effect functioning since 2004 as the new district administration.

Approximately 99% of the total population of the district is residing in rural areas as per Baksa District Handbook Census 2021. As per 2011 census report, the sex ratio in the district is 974 which is has been found above the State and national sex ratio of 954 and 940 respectively. The proportion of Scheduled Tribes population is found 34.84%, which is comparatively higher than the state proportion of 12.5%. While the rate of Combined Literacy is found 69.25% and Female Literacy 61.27% are below the State rate of 73.18 and 67.27, respectively.

Constitutionally, all Bodos are Scheduled Tribe (ST) but all Scheduled Tribes (ST) are not Bodos. However, the Bodo community formed as the largest Scheduled Tribes community in the state of Assam. Comparatively they are lagging behind to other communities in respect of utilisation of various healthcare services.

As per Human Development Report (HDR) Assam 2014, it has been found that life expectancies are relatively lower in Baksa district unlike other four districts of Assam i.e. Karimganj, Hailakandi, Tinsukia and Sonitpur. The dimensional achievement in health in the state reveals that the maximum level of achievement is witnessed in Kamrup (80 per cent of the goal) while the lowest is observed in Cachar (only 30 per cent of the desired goal). It is to be mentioned

that Baksa district has the 2nd lowest achievement in health *(*AHDR 2014)**.** In terms of dimensional achievement in the income dimension, the average achievement level in the state is found to be only at 50 per cent of the goal. The Baksa district has below the state level percentage of the goal and stood in 5th bottom position. As per AHDR 2014, the estimated value of HDI in Assam is found to be 0.557 whereas HDI value of Baksa district is only 0.437 which is lowest among the districts of Assam. The estimated health inequality in Assam is found to be 0.321**.** According to National Sample Survey Organisation (NSSO) the 60th Round of 2004-05 report, per 1000 population, 82 persons in rural Assam and 83 in urban Assam reported suffering from diseases. Using a common reference period of 12 months, the HDR 2014, Assam finds a prevalence rate of short-term common morbidities as 125 per 1,000 persons whereas 129 persons in rural and 99 persons in urban areas reporting any illness during the reference period. Baksa district falls under the higher rate than the state level prevalence of short term common morbidities however; the prevalence of chronic morbidity in the district is lower than the state level.

The above facts indicate that Baksa district is relatively backward compared to other districts of Assam. It has been noticed that the achievements in respect of human development index, life-expectancy, inequalities in healthcare facilities, and higher level of morbidities, proportion of utilisation of Out-patient door and In-patient Door healthcare services comparatively low in Baksa district.

It has been found that there is no any major study on utilisation of primary healthcare services of Primary Health Centres in the district. Therefore, an attempt has been made to focus on the healthcare delivery systems in the district of Baksa with respect to healthcare infrastructure, accessibility of primary healthcare services, utilisation among the Bodo community and factors associated with utilisation of healthcare services of Primary Health Centres.

1.6 Objectives

The following objectives have been taken for the study:

1. To explore infrastructural facilities of Primary Healthcare Service in the study area.

2. To examine the extent of utilisation of Primary Healthcare Services by the Bodo community in the study area.

3. To investigate the factors affecting the utilisation of Primary Healthcare Services.

1.7 Research Questions

The following research questions are considered for addressing the issues of utilisation of the Primary Health Centres by Bodo community of the Baksa district in Assam.

1. Whether utilisation of primary healthcare services depends on geographical factors?

2. How is the opening hour of the Primary Health Centres affecting the utilisation of available healthcare services?

3. Whether demographic factors affect the utilisation of healthcare services of Primary Health Centre amongst the Bodo community?

4. Whether the socio-economic factors affect utilisation of health services of Primary Health Centre amongst the Bodo community?

5. Whether utilisation of primary healthcare services depends on need factors of healthcare service?

1.8 Methodology and Database

Since methodology is an important part of Research work, therefore with a view to fulfill the research objectives and to decide about the set research questions a specific research methodology has been designed.

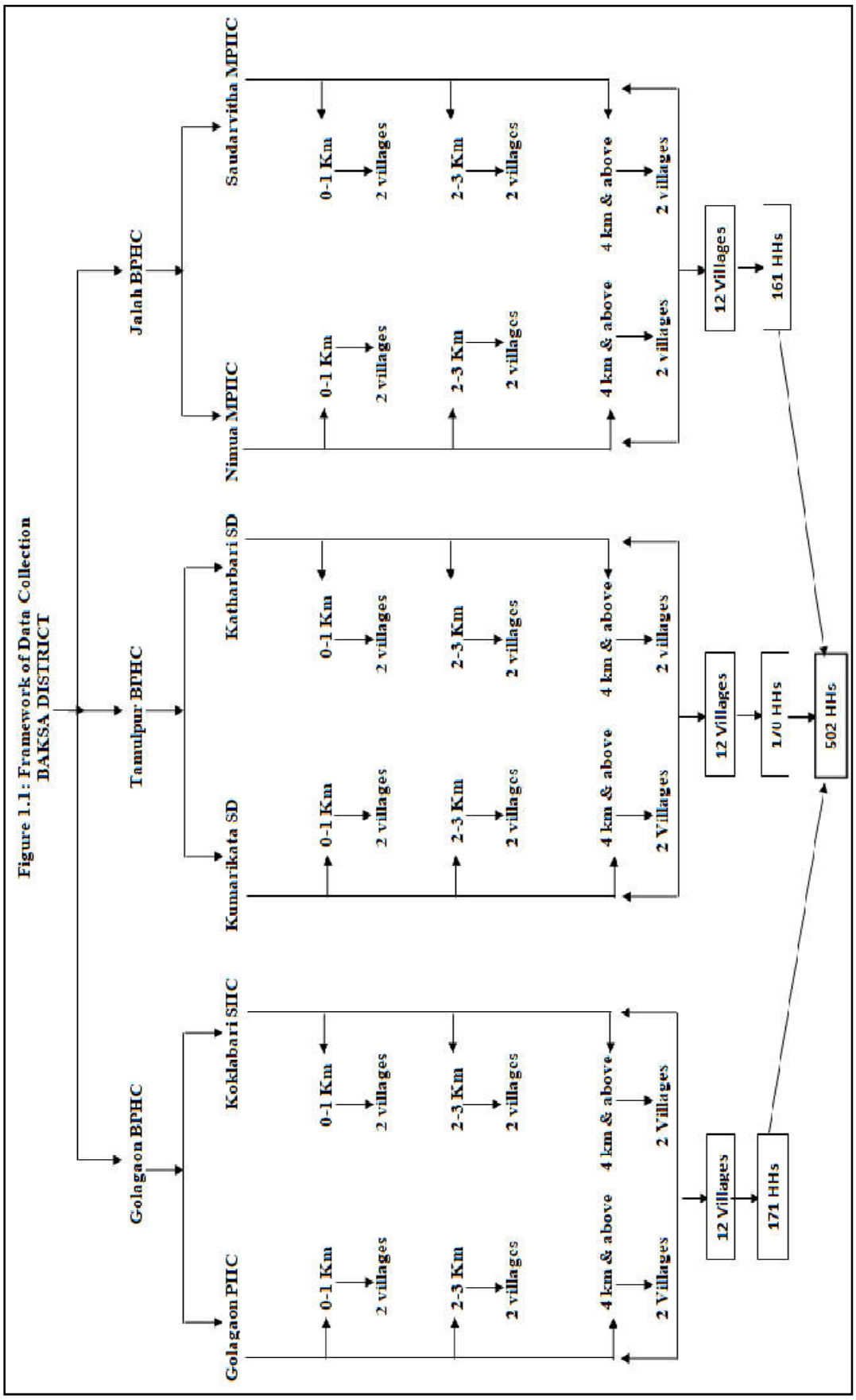
1.8.1 Sample Framework and Selection of Households

The frame work of data collection from sample households has been presented in figure 1.1. Map with regard to health institutions in Baksa district has been presented in Annexure - 2.

At present, there are six (06) Block Primary Health Centres (BPHCs) namely- Barama, Mushalpur, Tamulpur, Nizkaurbaha, Jalah and Golagaon are functioning in Baksa district. The Block Primary Health Centre (BPHC) monitors and supervises the functioning of PHCs within its jurisdiction in providing health care service. Accordingly, six (06) BPHCs are monitoring and supervising the functioning of PHCs in delivering health care services in the Baksa district of Assam.

Firstly, three Block Primary Health Centres (BPHCs) namely- Golagaon, Tamulpur and Jalah are selected purposively out of total six BPHCs of the district.

Secondly, from each selected Block PHC, two Primary Health Centres (PHCs) are being selected purposively and considering the availability of households and villages belonging to Bodo community. The selected PHCs are – Golagaon and Koklabari from Golagaon BPHC, Kumarikata and Katharbari from Tamulpur BPHC and Nimua and Saudarbhita from Jalah BPHC. Although, these PHCs are selected purposively, the statistical data from Census of India 2011 has been consulted to find out the distribution of the villages residing majority of Bodo community as required for collection of data from sample households.



Source: Field Survey

Thirdly, after selection of six PHCs, considering location of each PHC at centre point, three distance level has been defined to select two villages from each distance level. They are

i) 0-1 Km - 2 villages
ii) 2-3 Km - 2 villages
iii) 4 Km and above - 2 villages

Thus, a total of six villages are selected randomly from each selected PHC on distance level. However, it has been taken care to include the villages from each direction from the selected PHC based on distance level. Accordingly, a total of 36 villages have been selected from study area.

Finally, 10% households are randomly selected from each village under study. However, to obtain enough sample size, a minimum of 10 households were surveyed from each selected village where the number of households are below 100.

The population and households composition has been given in Annexure 2**.** On the basis of Census 2011, 10% households are being selected from each sample villages from the study area. However, if selected villages are having less than 100 households, a minimum of 10 households are being selected to obtain sufficient sample size.

To select the sample villages, first the Census of India 2011 was considered as source to find out the households of Scheduled Tribes and then visited physically the villages to check and confirm whether the villages are having Bodo population or not. Accordingly, villages are selected within the defined distance level.

Finally, from each selected villages, 10% households are randomly selected. Further, to obtain enough sample size, a minimum of 10 households were surveyed from each selected villages where the number of households are below 100.

To neutralise the distance variability (to PHC) within selected villages the households are selected from the end of each direction and the centre of the village. Therefore, a household located in the centre of the village is selected and then two households from both ends of the village and the rest are collected purposively with equal chances of inclusion in the sample. In the interview schedule, information has been collected from the household about the socio-economic characteristics, availability and accessibility of public health services, quality of health care, and utilisation of primary healthcare services.

Table 1.1: Selected Villages and Sample Households Composition

BPHC	Name of PHC	Village	Distance (0-1 Km)	Village	Distance (2 – 3 km)	Village	Distance (4 Km & Above)	Total
Golagaon BPHC	Koklabari SHC	Hajuwa	10	Karhana	12	Gorumara	32	181
		Baniakuchi	11	Odalguri	21	Karankata NC	10	
	Golagaon PHC	Dangarigaon	12	Theburmur	10	Dangarigaon NC	10	
		Dubagaon	22	Laokhata	21	Bhutiapara NC	10	
Jalah BPHC	Nimua MPHC	Nimua	16	Katajhar	18	Jengengpara	10	165
		Sonpaira	10	Khagrabari	10	Simlaguri	12	
	Saudarvitha MPHC	Ramchartari	15	Bartari	17	Sonaphuli	10	
		Barbari	23	Barfena	10	Chamuagati	14	
Tamulpur BPHC	Katharbari SD	Katharbari	18	Tebitola	10	Goibari	19	156
		Kalseni	15	Dangargaon no. 2	19	Hastinapur	10	
	Kumarikata SD	Batiamari	10	Bherakhat	11	Kumarpara	14	
		Matangapar	10	Singramari	10	Chesapani	10	
Total			**171**		**170**		**161**	**502**

N.B.: Unit represents households

Thus, details of selected villages and number of sample households from each selected villages has been presented in Table 1.1. It has been observed that 10 households (HHs hereafter) from village Hajuwa, 11 HHs from village Banikuchi, 12 HHs from village Karhana, 21 HHs from village Odalguri, 32 HHs from village Gorumara and 10 HHs from village Karankata are surveyed from Koklabari SHC under Golagaon BPHC.

Similarly, 12 HHs from village Dangarigaon, 22 HHs from village Dubagaon, 10 HHs from village Theburmur, 21 HHs from village Laokhata, 10 HHs from village Dangarigaon NC and 10 HHs from village Bhutiapara NC are surveyed from Golagaon PHC under Golagaon BPHC.

Again, 16 HHs from village Nimua, 10 HHs from village Sonpaira, 18 HHs from village Katajhar, 10 HHs from village Khagrabari, 10 HHs from village Jengengpara and 12 HHs from village Simlaguri are surveyed from Nimua MPHC under Jalah BPHC.

In the same way, 15 HHs from village Ramchartari, 23 HHs from village Barbari, 17 HHs from village Bartari, 10 HHs from village Barfena, 10 HHs from village Sonaphuli, and 14 HHs from village Chamuagati are surveyed from Saudarvitha MPHC under Jalah BPHC.

Similarly, 18 HHs Katharbari, 15 HHs from Kalseni, 10 HHs from Tebitola, 19 HHs from Dangargaon no. 2, 19 HHs from Goibari and 10 HHs from Hastinapur are surveyed from Katharbari SD under Tamulpur BPHC.

Likewise, 10 HHs from village Batiamari, 10 HHs from village Matangapar, 11 HHs from village Bherakhat, 10 HHs from village Singramari, 14 HHs from village Kumarpara, 10 HHs from village Chesapani are surveyed from Kumarikata SD under Tamulpur BPHC.

Thus, a total of 502 households are surveyed in the study comprising 181 HHs from Golagaon BPHC, 165 HHs from Jalah BPHC and 156 HHs from Tamulpur BPHC respectively. Whereas, in distance level, the distribution of HHs are found as 171 HHs from 0-1 km, 170 HHs from 2-3 km and 161 HHs from 4 km and above respectively.

1.9 Source of Data

Both primary as well as secondary data have been collected for the study.

1.9.1 Secondary Data*:* Secondary data are collected from various sources to highlight the status on healthcare services with facts and figures as well as for comparative analysis of the health scenario. Secondary data are collected from various publications, documents, e-resources sources, reports etc. of local, state, national and international organisation, agency, department, ministry with relevance to this study. Further, e-publications relating rural healthcare delivery system are also undertaken to explore and to obtain overall insights on healthcare scenario in the state of Assam with special reference to Baksa district.

Secondary data sources are-

(i) Baksa District website e-resources
(ii) Directorate of Health service of Assam
(iii) NRHM/NHM websites and e-publications
(iv) Assam Statistical Hand Book, 2015 & 2019
(v) Assam Human Development Reports, 2015
(vi) District Level Households Survey 3, 4 & 5
(vii) Census Reports 2001 & 2011
(viii) Survey Reports of National Sample Survey Organisation (NSSO)
(ix) National Family Health Survey (NFHS) e-publications
(x) Ministry of Health and Family Welfare (MoHFW) e-publications

(xi) Rural Health Statistics Bulletin

(xii) Indian Institute Population Studies (IIPS) e-resources

(xiii) National Centre for Applied Economics and Research(NCAER)

(xiv) Planning Commission Reports e-resources

(xv) Human Development Reports series 2014 - 2018

(xvi) World Health Organisation (WHO) and web resources

(xvii) World Bank publications

(xviii) United Nations publications and web resources

1.9.2 Primary Data: Primary Data have been collected through two interview schedules designed for the study.

(i) Interview Schedule for Households

The multi-stage purposive sampling method of non-probability sampling technique has been adopted to select the sample households. The pilot study had been done for testing the reliability of the interview schedule before carrying out the data collection for the purpose of study. The information from the sample households are collected on demographics, socio-economic and morbidity.

(ii) Interview Schedule for Facility Survey at PHCs

Further, facility survey in selected PHCs has been conducted through structured interview schedule. The interview schedule is designed for healthcare personnel to collect information on physical infrastructure, manpower position and the healthcare services.

1.10 Tools and Technique for the Study

1.10.1 Quantitative Data Processing

The quantitative data collected through the household survey as well as facility survey are processed using Statistical Packages for Social Sciences (SPSS) 25 software. After completion of the data entry, data file has been checked for erroneous entry of data and duplicate records in the file and finally using the SPSS programs the necessary output tables have been prepared for analysis.

1.10.2 Specification of Variables for the Study

Dependent Variable: The respondents have been asked whether any/more illness member of their households has/have visited (PHCs) for healthcare services or not. Hence, this study is based on the sample household data on the utilisation of healthcare services of PHCs reported having illness of any member of the households. Thus, visit to the PHCs is the dependent variable (Y) with binary responses and coded as Y=1, Visited and Y=0, Not Visited respectively.

Independent Variables: Independent variables which may affect the dependent variable are categorised into four - (1) accessibility factors- distance and opening hours of PHCs, (2) socio-economic factors - religion, occupation, MPCE, SLI, family size and education (3) demographic factors- gender and age (4) need factors- type of illness and severity of illness are considered. The explanation and justification about independent variables elaborated as below.

i. **Distance**: Geographical factors such as distance and location of the PHCs occupy an important role in determining the utilisation of accessible health services. Distance has been considered one of the

highly influential factors that may affect the level of utilisation of Primary Health Centres by the households in the study area.

ii. **Opening Hour of PHCs:** Apart from the accessibility and availability of the healthcare services provided by Primary Health Centres, the opening hour may be associated with the utilisation of Primary Health Centres in the study area. Hence, whether the timing of opening hours of the PHCs is convenient or not is included as an independent variable to assess the level of utilisation of Primary Health Centres.

iii. **Religion:** Belief system or religion is also considered as an independent variable. Because religion can play a significant role in the outlook of the households on visiting Primary Health Centres for utilisation of primary health care services. Traditional belief still exists among the Bodo community. The majority of the households under study reported that the Bathou as their religion parallel to Hindu. The Government of Assam announces every Calendar year as Gwthar Bathou San (Holy Bathou Day) as a restricted holiday for followers of Bathou. Nevertheless, the Bathou may be considered as animism among the Bodos in parallel belief in Hindu.

iv. **Gender of Household Head:** The gender of the household head is considered an independent variable to assess the influence on utilisation of Primary Health Centres. Head of the family may decide to visit or not the PHCs if any of the family member(s) suffers from illness.

v. **Age Group of Household Head:** Age is also considered as the predisposing factor that affects the utilisation of healthcare services. In the present study, the Age of Household Head has been considered an independent variable to assess the impact on the utilisation of healthcare services from Primary Health Centres.

vi. **Occupation of Household Head:** Occupation of household head has been considered one of the independent variables to examine the impact on the level of utilisation of health care services of the Primary Health Centres (PHCs).

vii. **Highest Educational level of household:** Highest educational level in the households is also included as an independent variable to assess the level of utilisation of Primary Health Centres. The highest educational level of any member of the household influences the overall environment of the family and impacts the visit to the Primary Health Centres.

viii. **Monthly Per Capita Consumption Expenditure (MPCE):** Monthly Per Capita Consumption expenditure is considered the proxy of income of the households. It reflects the actual scenario of the expenditures incurred by the households even without sufficient income to meet the needs of the households. Hence, the MPCE has been considered as a categorical variable to observe the utilisation level of the Primary Health Centres.

ix. **Size of family:** The size of family may affect the utilisation of Primary Health Centres. Here in this study, the size of family has been categorised into three, i.e. small (1-3 members), Medium (4-7 members) and Big (8 and above members).

x. **Standard of Living Index (SLI):** The SLI scale gives a more accurate and realistic picture of the Socio-economic. The SLI scale presents a more accurate and realistic picture of the SES of the family and so, it should be the scale recommended for measurement of SES in urban and rural setting. The main advantage of SLI scale has over other scales is that scoring system can be modified depending on the requirements[14]. Information on household ownership of 19 different types of durable goods and four different means of transportation,

possession of a bank account, and coverage by a health scheme were included to assess the living standard of the population. Of the items asked about, only a few are owned by a majority of households (NFHS-3)[15].

The methodology of computation of standard of living index has been applied in a study on Fertility and Health Behaviour among Hindu and Muslim Women in Assam (Rajput, 2011)[16]. The present research work follows the same methodology with small change of variables and score. Therefore, ownership of goods has been categorised broadly into 8 items based on primary data. The computation of Standard of Living Index (SLI) includes the following variables assigning the score for the different facilities, goods and resources of the households as given below:

Variable	Scores
Type of House	Kuccha = 1, Semi Pucca = 2 and Pucca = 3
Separate Kitchen Room	No = 0 and Yes=1
Source of Lighting	Kerosene or Others = 1 and Electricity/Solar panel light = 2
Fuel for Cooking	Firewood = 1, LPG + Firewood = 2 and LPG = 3
Source of Drinking water	River/Pond=1, Well=2 and Tube well/Water supply = 3
Defecation system	Any other = 1, Pit = 2 and Septic Tank =3
Agricultural Land	No land = 0, 1 to 5 Bighas = 1 and 6 Bighas and above = 2
Ownership of Goods	Fan=1 TV=2 Mobile Phone=3 Refrigerator=4 Motorcycle =5 and Car = 6
SLI	**Score Range = 5-38**
Categories of SLI	**Range-Low=5-15 Medium=16-27 High =28-38**

In the present study, SLI has been categorised into three categories such as - Low SLI (5-15), Medium SLI (16-27) and High SLI (28-38).

xi. **Anybody chronic illness:** Type of illness is one of the factors of needs as regarded by Andersen Model on the health care utilisation. Hence, anybody having chronic illness in the household has been included as one of independent variables to find the association of the utilisation of Primary Health Centres.

xii. **Anybody severe illness:** Perceived or observed Severity is also considered one of the need factors for utilising healthcare services. Here, anybody illness is severe or not in the households has been considered as another independent variable to examine the utilisation level of healthcare services of Primary Health Centres. Under this study, perceived or observed severity of illness has been classified into two categories such as a) mild or somewhat severe and b) severe.

Thus, according to the research questions for the study, responses on independent variables have been categorised as given below-

X_1= Distance (0-1 km= 1, 2-3 km= 2 and 4 km and above= 3)
X_2= Opening Hours (Convenient =0 and Inconvenient=1)
X_3= Religion (Bathou = 1, Hindu= 2 and Christian = 3)
X_4= Gender of Household Head (Male=1 & Female=0)
X_5= Age of Household Head (< 35 years=1, 35-45 years=2, and
Above 45 years =3)
X_6= Occupation of Household Head
(Government Employee =1, Farmer =2,
Casual Labour =3 and Business =4)
X_7= Family highest level of education
(Primary level =1, Under-matriculate =2, Matriculate= 3,
Higher Secondary=4, and Graduate and above=5)
X_8= Family Size -Small (1-3 members) =1, Medium (4-7 members) =2
and Big (8 and above members) =3)

X_9= MPCE (Less than or equal to ₹ 1500.00=1, ₹ 1501--3000=2 and ₹ 3001and above =3)

X_{10}= Standard of Living Index (Low (5-13 score) =1, Medium) =2 and High (27-38 score) =3

X_{11}=Anybody Chronic Patient in the family (Yes=1 and No=0)

X_{12}= Anybody Severe (Yes=1 and No=0)

1.10.3 Methods of Statistical Analysis

This study includes the households having reported illness case(s) in the reference period of 2018. Therefore, if any illness member(s) of the household visited the PHCs or not for utilisation of healthcare services during the reference period has been considered for data analysis.

The quantitative data have been analysed by using three statistical methods:

(i) Descriptive Analysis
(ii) Bivariate Analysis
(iii) Binary Logistic Regression Analysis

(i) Descriptive Analysis

At first step, a descriptive analysis of the quantitative data has been done. It provides a description of the characteristics of the study population with regard to utilisation of healthcare services of PHC which provides a good basis for further statistical analysis.

(ii) Bivariate Analysis

To find out the associations between dependent and independent variables, bivariate analysis has been performed. Chi squared tests has been used to examine the statistical significance of association between dependent and independent variables. Here, Visited PHC- for healthcare services by Households during reference period with response Yes=1 or No=0 has been shown as Independent variable.

And variables like-Distance, Religion, Age of Household Head, Gender of Household Head, Occupation of Household Head, Highest educational level of the household, Family Size, MPCE, Standard of Living Index, Perceived convenient opening hour of the PHC, Anybody Chronic Patient in the family and Anybody Severe have been included as dependent variables. Thus, altogether 12 independent variables are considered in the model as explanatory variables to study the impact on the utilisation of primary health care services of Primary Health Centres.

(iii) Binary Logistic Regression Analysis

Logistic technique is used when the response variable is binary or dichotomous. The predictor variable may be quantitative or categorical or a mixture of the two (Clark and Hosking 1986, Retherford and Choe 1993). The bivariate analysis provides the individual association between the two variables. Nevertheless, several confounding factors may affect the dependent variable because the relationships between the two variables are not always one to one. Further, logistic regression is a statistical technique used to predict the relationships between independent and dependent variables where the outcome of the dependent variable is binary. Therefore, logistic regression analysis has been used in order to explore the association for those confounding factors.

Moreover, logistic regression is used when the dependent variable or the response variable is qualitative. The dependent variable under the

study is binary or dichotomous; hence, the logistic regression model has been used to examine the effects of independent variables on the visit to the Primary Health Centres (PHCs) for healthcare services. Thus, logistic regression model for the present study has been described below.

Odds and Odds Ratio

Logistic regressions work with odds and odds ratios. The odds are the probability of an event occurring divided by the probability of the event not occurring. In other words, odds are simply the ratio of the probabilities for the two possible outcomes. In this study, the results have been interpreted in terms of Odds ratio. If P is the probability that the event will occur, then 1–P is the probability that the event will not occur:

$$\text{Odds}(\text{Y} = 1) = \frac{\text{P}(\text{Y} = 1)}{1 - \text{P}(\text{Y} = 1)}$$

An odds ratio (OR) measures the association between explanatory variables (independent variables) and an outcome (dependent variable). Thus, odds ratio represents the odds that an outcome may occur given a particular exposure divided by the odds of the outcome not occurring of that exposure. In other words, the odds ratio is calculated by dividing the odds of the first group by the odds in the second group.

It is common and easy to report the odds ratios instead of interpreting the coefficients returned by the logistic regression analysis. An odds ratio less than 1 means that an increase in X leads to a decrease in the probability of Y=1. An odds ratio greater than 1 means that an increase in X leads to an increase in the probability of Y=1. In general, it is possible to determine the percentage change in the probability of a unit change for a given predictor variable, i.e.

$$\% \text{ Change in Odds} = 100(\text{OR} - 1)$$

In the logic function, the probability of occurring of an event is-

$$P = \frac{1}{1+e^{-Z}} = \frac{e^{Z}}{1+e^{Z}}$$

When Z is a linear function of independent variables, it becomes a multivariate logistic function instead of a bivariate function.
Thus,

$$Z=a+\beta_1 x_1+\beta_2 x_2+\beta_3 x_3+\ldots\ldots\ldots\ldots\beta_i x_i$$

In other words, the probability of not occurring of an event is

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

Thus, $\frac{P}{1-P}$ equals the odds of occurring the event is $\frac{P}{1-P} = e^{Z}$.

The logistic model for of the given predictor variable is

$$L = \ln(\frac{P}{1-P}) = Z$$

In logistic regression, a logistic transformation of the odds (referred to as logit) is used as the dependent variable.

The logistic regression model used for test can be written as-

$$\log(\frac{P}{1-P})= \beta_0 + \beta_1 \text{Distance} + \beta_2 \text{Opening Hour} + \beta_3 \text{Religion} + \beta_4 \text{Gender} + \beta_5 \text{Age} + \beta_6 \text{Occupation} + \beta_7 \text{Education} + \beta_8 \text{Family Size} + \beta_9 \text{MPCE} + \beta_{10} \text{SLI} + \beta_{11} \text{Chronic} + \beta_{12} \text{Severe}$$

1.11 Limitation of the Study

The present study confined to utilisation of Public Healthcare Centres only by Bodo community in Baksa district of Assam. This study not included the private healthcare facilities. Bodo community has been considered for the study; however other communities could have been included to have wide and in-depth study to get overall scenario on the health care utilisation of PHCs in the district.

Although, the results obtained from the study, it may be generalised for the entire district because of the fact that around 99% populations are residing in rural areas.

1.12 Chapterisation

The entire research work has been presented into six chapters. These are -

Chapter - 1: Introduction and Research Methodology

Chapter - 1 deals with introductory part and research methodology. It particularly contains with Historical Background of Primary Health Care, Primary Health Care in India, Significance of the Study, Rationale for Selection of the Study Area, Objectives, Research Questions, Methodology, Data source, Dependent and Independent variables, Statistical methods, Regression Model and Limitation of the study.

Chapter - 2: Review of Literature

Chapter - 2 has presented the reviews of available related literatures of the study. Numerous empirical studies regarding the utilisation of health care services have been reviewed and presented into four sections as given below:

Section-I deals with the Availability and Accessibility of Healthcare Facilities and Utilisation
Section-II deals with Distance, Location and Utilisation
Section-III deals with Socio-Economic Aspects and Utilisation
Section-IV deals with Needs, Perception and Utilisation.

Chapter - 3: Public Health Care Infrastructure in Assam and Baksa District

Chapter - 3 deals with in-depth assessment of existing health care facilities in the state of Assam and Baksa district. Further, it highlights the basic facilities for healthcare services of six selected PHCs under study.

Chapter - 4: Profile of Sample Households in the Study Area

The socio-economic profile of the sample households have been presented in Chapter - 4. It also deals with the demographic composition as well as the other health care issues of the sample areas under this study.

Chapter - 5: Utilisation of Primary Healthcare Services in the Study Area

Chapter - 5 deals with the all the aspects of health care utilisation pattern and the factors responsible for the level of utilisation of PHCs in the sample areas. The model analysis for testing the research question have also very extensively presented in this chapter.

Chapter - 6: Summary and Conclusion

The summary of the study has been presented in Chapter - 6. Findings of the study, suggestions and scope for future study have been elaborated in this chapter.

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