CHAPTER-I

1.1 Introduction

Medical Geography is one of the branch and dynamic force in Geography. Medical Geography is a combination of “Both an ancient perspective and a new specialization”. As illustrated by the quote from Hippocrates, who lived in 4th century B.C. was familiar gave much importance to geographical aspects of a place where an individual wishes to settle. He advocates taking into account the factors such as, climate, locality and human behavior, as potential causes of many diseases (Meade and Earickson 2000). Within the medical geography, two areas or traditions of study are recognized. The first tradition is concerned with the disease and mortality and studies the relation between ill-health and environment, it referred as ‘Geographical Epidemiology’, ‘Geographical Pathology’, ‘Disease Ecology’, or’ Diseases Geography’. The second stream addresses the location, accessibility and utilization of health services, which referred as ‘Health Care Geography’, ‘Geography of Medical Care’ and Geography of Health Service Provision. Since the 1990s, a new vision of health geography has come up and found recognition, running parallel with the recent discussions and shifts in the disciplines of social geography and population geography. The new developments have been accompanied by a growing preference for the terms ‘Health Geography’ and ‘Geography of Health’ (Maaike den Draak 2005).

Medical geography concerned with geographical aspects of health (status) and health care (systems) of population in a certain area or region. It tries to identify the factors which affect on public health. R.W. Armstring (1979) said that, Geography is the study of place and Medical Geography is the study of health and medical characteristics of places. Its objective is to understand the geographical variation in conditions of health and illness. Medical geography has some significant contributions in present years, a good number of studies were appeared which examined the various dimension of research in the subject. It studies on Geography of nutrition, Disease ecology, and socio-cultural aspects of health, health behavior, traditional medicine and Health Care Geography.
The Geography of health care comprises the analysis of spatial organization (number sizes, types, and locations) of health services, how and why spatial organization changes over time, how people gain access to health services, and the impacts on health and well being. The geography of health care is concerned with the recurrent themes are, spatial distribution of health services, the access to healthcare and the utilization pattern of services, and the planning of health care services. The extent to which use of services declines with distance from facilities, policy criterions and performance standards, variety in health care systems, and the reforms of national health care systems (Maaike den Dark, 2005).

1.2 Concept of Health and Health Care

Health is an invaluable gift of nature. It is one of the basic needs of all the human beings and it’s influenced by many factors, such as, food, housing, basic sanitation, healthy lifestyles, protection against environmental hazards and communicable diseases. Health is man’s natural condition and his birth right which is the result of living in accordance with the natural laws pertaining to the body, mind and environment. According to “WHO” in 1948, the definition on the concept of health is, “a state of complete physical, mental and social well being of the individual and not merely the absence of disease or infirmity”. In 1986, the WHO, in the Ottawa Charter for Health Promotion, said that, health is ”a resource for everyday life, not the objective of living. Health is a positive concept emphasizing social and personal resources, as well as physical capacities”. The repeated proverbs like “Health is Wealth” “Cleanliness is godliness”. A Sound mind in a sound body indicates the Universal reorganization of the importance of health. Therefore, Health has occupied the highest place in the life of man from time immemorial. Health has several dimensions; each dimension is important but its relative importance, i.e., other dimensions depends on the circumstances in which an individuals or community. The dimensions are: Physical, Mental, Nutritional, environmental, educational, socio-cultural, economic, preventative and curative (R.P.Misra, 2007).
Health care is an essential sector to develop for better standard of living, refers to the treatment and management of illness, and the preservation of health through services offered by the medical, dental, pharmaceutical, clinical laboratory sciences (i.e. Diagnostics), in using and allied health professions. Health care embraces all the goods and services designed to promote health, including, “Preventing, curative and palliative interventions whether directed to individuals or to populations” (WHO 2000). The main theme of healthcare is; to provide complete health facilities, to protect every one physical, social, and mental health, to decrease the death rate, to increase the life expectancy of man and socially for balanced development. Health is quality of life and involves the responsibility of governments for its maintenance and to achieve a social goal.

1.3 Health Care System

The Health care system acts as an intermediately between the providers and the seekers. Health care systems are more oriented towards curative healthcare. Healthcare is one of India’s largest service sectors. The Indian health sector can be viewed as a glass half empty or a glass half full. The challenges which the sector faces are substantial, from the need to reduce mortality rates, improve physical infrastructure, necessity to provide health insurance, ensuring availability of trained medical personnel etc. There has been a rise in both communicable and non-communicable diseases, including chronic disease (Krista Mahr 2013). As Indians live more affluent lives and adopt unhealthy diets that are high in fat and sugar, the country is experiencing a rapidly rising trend in non-communicable diseases such as cancer, diabetes that is expected to grow at a faster rate than infectious diseases (Rajan & Prabhakaran 2012). In addition, to that, the growing elderly population will place an enormous burden on India’s healthcare systems and services. There are considerable shortages of hospital beds and trained medical staffs such as doctors, Nurses etc., and as a result public accessibility is reduced. There is also a considerable rural-urban imbalance in which accessibility is significantly lower in rural compared to urban areas (planning commission, 2012). A good healthcare system consist many characteristics like Adequacy, availability, accessibility, affordability and feasibility.
1. **Availability** – the existing healthcare services and goods meet clients needs;

2. **Accessibility** – the relationship between the location of supply and the location of users, taking into account the user transportation resources and travel time, distance and cost.

3. **Affordability** – the resources (income, health benefits) for purchasing care related to the price / cost of the supply.

4. **Adequacy** – the organization of health care services proportion to requirements’ of population.

5. **Acceptability** – the level in which the characteristics of health facilities take social/cultural concerns – attitudes on religion, gender, race, neighborhood, tribe – of patients and providers as they relate to the attributes of each other. (Penchansky, 2001).

These are the factors related to individual circumstances that have found to have an influence on the access to health care often translated into utilization rates.

### 1.4 Structural Model of Health Care Systems

Under the Indian Constitution, health is a state subject. Each state therefore has its own healthcare delivery system in which both public and private (for profit as well as non-profit) actors operate. While States are responsible for the functioning of their respective healthcare systems, certain responsibilities also fall on the central government, namely planning, policy making, evaluating and coordinating, the work of various provincial health authorities and providing funding to implement national programmes.
Figure: 1.1  India’s Healthcare System

Source: Swedish Agency for Growth Policy Analysis, Sweden
The Indian Health care system is mainly based on three components: Providers, seekers and the Health care system. The Indian Systems of medicine consists of both Allopathy and Ayush (Ayurveda, Yoga, Unani, Siddha and Homeopathy). India’s Healthcare system is characterized by multiple systems of medicine, mixed ownership patterns and different kinds of delivery structures. Public sectors ownership is divided between central and state governments, Local governments (municipals and panchayats). The facilities include teaching hospitals, secondary level hospitals, first referral hospital (CHC) dispensaries; Primary health centres, subcentres and health posts. Also included are public facilities for selected occupational groups like ESI, defence, government employees (Central government health scheme-CGHS), railways, post and telegraph and mines among the others. The private sector (for profit and not for profit) is the dominant sector and services.

The organization at the national level consists of

- The Union Ministry of Health and Family Welfare (MoHFW).
- The Directorate general of health services and
- The central council of health and family welfare.

The Ministry of health and family welfare is headed by a cabinet minister, state minister and a deputy minister belongs to the departments of health and department of family welfare. In the state level it includes the provision of medical care and preventive health services within the state. The state is responsible for all the health services operating within its jurisdiction (Planning Commission, 2012).

The District level structure of health services is a middle level management organization and it is a link between the State and regional structure on one side and the peripheral level structures such as Primary HealthCare and Sub-Centre on the other. The structure and functions of healthcare centre’s facilities are primarily based on the consideration of institutional size, volume of work and the range of services that they provide for people. The structure of health care services are functioning at three levels, i.e., Primary, Secondary and Tertiary level. Primary level it is a first contact point of individuals, families and communities with the National Health System, where, Primary
health care is provided in the context of primary health centre’s and health sub Centres through a number of trained health workers. The next level is secondary health care includes the sub district or taluk hospital and community health centres which serves as the first referral level of health care to primary care system. The tertiary level is more specialized level than secondary care. District hospital is an essential component of the district health system and function as tertiary level of health care. All these health institutions provide curative, preventive and promotive healthcare services to the community in the district. The fig.no.1.2 shows the structure of the health care institutions in the district.

**Figure: 1.2 Structure Of The Public Health Care Institutions In District**
The health care institutions are structured in a hierarchical order, in order to optimize the use of resource available. The administrations of each level of health institutions are interrelated, for e.g.: The District Hospital the higher order service centre provide higher level services with greater administrative responsibilities. Where, the administration and function of PHU are consisting lower order services with lower administrative responsibilities. At the district level, the district health officer is in charge of public health and Family welfare programme with the head quarter at Mysore. The health Centres or institutions are functioning under a chain of administrators. For example, Medical officer, at primary health Centre, Chief medical officer at Community health centre or General hospital, district health officer/Chief medical officer/Civil surgeon at district hospital. These officials have to look after all the health care centres/medical care activities under their respective institution (Shashidhar, 2002).

1.5 Health Policy and Programmes In India

The Department of Health and Family Welfare services implements various National and State Health Programs of Public health importance and also provide complete health care service to the people through various types of health institutions. It may be noted that as many as nearly 33 different major health programmes have been introduced ever since independence in India. These programmes are sometimes generic in nature and applicable to the entire population; at times they aim at controlling specific mass diseases; sometimes they target women and children. And a few programmes are meant exclusively for children, the details of which are given in table:
Table: 1.1 Health Policy and Programmes in India

<table>
<thead>
<tr>
<th>YEAR</th>
<th>HEALTH PROGRAMMES</th>
<th>Nature</th>
</tr>
</thead>
<tbody>
<tr>
<td>1948</td>
<td>India Joined WHO</td>
<td></td>
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<tr>
<td>1951</td>
<td>BCG Vaccination Programme</td>
<td>Vaccination</td>
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<tr>
<td>1952</td>
<td>National Family Planning Programme</td>
<td>General</td>
</tr>
<tr>
<td>1953</td>
<td>National Malaria Control Programme</td>
<td>Disease Specific</td>
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<tr>
<td>1956</td>
<td>Central Health Education Bureau Established</td>
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<tr>
<td>1955</td>
<td>National Filaria Control Programme</td>
<td>Disease Specific</td>
</tr>
<tr>
<td>1955</td>
<td>National Leprosy Control Programme</td>
<td>Disease Specific</td>
</tr>
<tr>
<td>1958</td>
<td>National Malaria Eradication Programme</td>
<td>Disease Specific</td>
</tr>
<tr>
<td>1958</td>
<td>Primary Health Centres Programme</td>
<td>General</td>
</tr>
<tr>
<td>1962</td>
<td>National Goitre Control Programme</td>
<td>Disease Specific</td>
</tr>
<tr>
<td>1962</td>
<td>National Small Pox Eradication Programme</td>
<td>Disease Specific</td>
</tr>
<tr>
<td>1962</td>
<td>National tuberculosis Programme</td>
<td>Disease Specific</td>
</tr>
<tr>
<td>1962</td>
<td>School health Programme</td>
<td>Nutrition</td>
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<td>1963</td>
<td>Applied Nutrition Programme</td>
<td>Nutrition</td>
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<tr>
<td>1963</td>
<td>Mid-day meals Programme</td>
<td>Nutrition</td>
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<td>1964</td>
<td>Maternal and Child Health Programme</td>
<td>General</td>
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<tr>
<td>1966</td>
<td>Separate Department of Family Planning Started</td>
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<tr>
<td>1968</td>
<td>Extensive Family Planning started</td>
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<tr>
<td>1969</td>
<td>Promulgation of the Central Birth and Death Registration Act</td>
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<td>1970</td>
<td>Iron and Folic Acid Supplementary Programme</td>
<td>Nutrition</td>
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<tr>
<td>1970</td>
<td>Special Nutrition Programme</td>
<td>Nutrition</td>
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<tr>
<td>1971</td>
<td>Anemia Control Programme</td>
<td>Nutrition</td>
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<tr>
<td>1971</td>
<td>Vitamin A Prophylaxis Programme</td>
<td>Nutrition</td>
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<tr>
<td>1974</td>
<td>Minimum Needs Programme</td>
<td>General</td>
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<tr>
<td>1975</td>
<td>ICDS Programme</td>
<td>General</td>
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<tr>
<td>1975</td>
<td>Integrated Health Scheme</td>
<td>General</td>
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<tr>
<td>1976</td>
<td>National Programme for Prevention of Blindness</td>
<td>Disease Specific</td>
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<tr>
<td>1978</td>
<td>Expanded Programme of Immunization</td>
<td>Immunization</td>
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<tr>
<td>1980</td>
<td>National Diarrhea Control Programme</td>
<td>Disease Specific</td>
</tr>
<tr>
<td>1983</td>
<td>National Leprosy Eradication Programme</td>
<td>Disease Specific</td>
</tr>
<tr>
<td>1985</td>
<td>Universal Immunization Programme</td>
<td>Immunization</td>
</tr>
<tr>
<td>1987</td>
<td>National AIDS Control Programme</td>
<td>Disease Specific</td>
</tr>
<tr>
<td>1989</td>
<td>Blood Safety Programme</td>
<td>General</td>
</tr>
<tr>
<td>1990</td>
<td>ARI Control Programme</td>
<td>Disease Specific</td>
</tr>
<tr>
<td>1992</td>
<td>Child Survival and Safe Motherhood Programme</td>
<td>General</td>
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<tr>
<td>1995</td>
<td>Pulse Polio Eradication Programme</td>
<td>Immunization</td>
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<tr>
<td>1996</td>
<td>Reproductive and Child Health Programme</td>
<td>General</td>
</tr>
<tr>
<td>1999</td>
<td>New National Health Policy announced</td>
<td></td>
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<tr>
<td>2000</td>
<td>New National Population Policy announced</td>
<td></td>
</tr>
<tr>
<td>2005</td>
<td>National Rural Health Mission</td>
<td>General</td>
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</table>

The Indian government considers health is an important state subject. Its main aim is to the areas of control eradication of major communicable and non-communicable diseases, and for broad policy formulation, medical and para-medical education, drug control; prevention of food adulterine etc. A major portion of outlay is for the eradication of diseases like malaria, tuberculosis, leprosy, AIDS, blindness, cancer control. In 1946, the Bhore committee report on health pointed out for an integrated primary health care, social and preventive medical care, citizen’s participation; strong inter-sectoral cooperation and cooperation between central and state governments. The Alma Ata Declaration on Primary health care and the National Health Policy of the Government gave a new care the central function and main focus of its national health planning in India, making primary health care the central function and main focus of its national health system. The goal of national health planning in India was to attain Health for all by the year 2000 (Marikkani, 2012).

1.6 National Rural Health Mission (NRHM)

Central government launched the National Rural Health Mission (NRHM) in 2005 with a goal to improve the availability and accessibility of quality health care to the people, especially for those residing in rural areas, the poor, and women. The programme is a comprehensive package of promotive, preventive, curative and rehabilitative services to be delivered to the community through a process of inter-sectoral co-ordination with other services departments and active community participation. It adapts a synergic approach by relating health to determinants of good health viz., Nutrition, Sanitation, hygiene and safe drinking water. In order to improve the standard of care in PHC’s, NRHM has come up with a set of norms or standards called as Indian Public Health Services (IPHS) is to provide healthcare which is quality oriented and sensitive to needs of the community. NRHM gives importance to Mother and child health care. Various national programmes like, Immunization, tuberculosis control, leprosy elimination, cancer control etc., and state programmes like Janani Suraksha Yojane, Prasthuthi Arike and madilu, arogya kavacha, arogya sanjeeveni scheme, Arogya Bandhu and citizen help line etc, have been integrated under the NRHM programme that also address the social
determinants of health and delivery of the same with the active participation of Panchayat Raj Institutions (Local governance) for its sustainability.

The NRHM sought to increase public spending on health, reduce to regional imbalances in health infrastructure, pool resources and integrate various organizational structures and national programmes. At the village level the government has promoted the concept of having an accredited female social health activist (ASHA) in order to facilitate household access to healthcare. Village health committees of the panchayat raj are responsible for putting in place village health plans. The institutional design of the NRHM includes a number of entities at different levels - village, district, state and central. (Srinath. V, Planning Commission 2012).

1.7 Karnataka Health Policy

Karnataka State recognizes the immeasurable value of enhancing the health and well being of its people. The state’s developmental efforts in the social, economic, cultural and political spheres have, as their overarching goals, improved well being and standards of living, better health, reduced suffering and ill health, and increased productivity of its citizens. It is recognized that health and education are central to development. Health is an individual and collective responsibility. The constitutional mandate, role and responsibility of the State in providing direction in creating a policy framework, in health care provision and related endeavors, including maintenance of standards of health care, is the important in meeting these social development objectives.

The state government mission is to provide improved access to good quality health care and promote an enabling environment for development of the health sector. It will endeavor to provide quality of health care with equity, which is responsive to the needs of the people, and is guided by principle of transparency, accountability and community participation. Karnataka state health policy perspective and goals are:

- To provide integrated and comprehensive primary health care
- To establish a credible and sustainable referral system
- To establish equity in delivery of quality health care
 To encourage greater public private partnership in provision of quality health care in order to better serve the underserved areas.
 To address emerging issues in public health
 To strengthen health infrastructure
 To develop health human resources
 To improve the access to safe and quality drugs at affordable prices
 To increase access to systems of alternative medicine

Health Indicators and systems for monitoring and evaluation that would allow review and assessing the progress towards achieving specific objectives that derive from the goals would be formulated and put in place. The scope of policy is, to facilitate the balanced development of health system and service responsive to health needs and aspirations of people, Karnataka state considers it is necessary to have a comprehensive health policy statement in which different elements are integrated together and viewed as a whole. Various units may evolve more detailed policy guidelines. The state will undertake measures to operationalise a comprehensive, integrated health service, with promotive, preventive, curative and rehabilitative health care services at primary, secondary and tertiary levels, linked together with good referral systems. Health policy may consider has the social development of the people of the state (Karnataka State Health Policy, 2003).

1.8 Role of GIS in HealthCare

Geographic Information System (GIS) is a technology with unique and valuable applications for planners, geographers, computer scientists, social scientists, engineers and in many fields. GIS is becoming increasingly popular in health care research in recent years. GIS it includes Database management, location of healthcare, mapping, planning, retrieval of spatial data etc., one of the reasons for sudden surge GIS usage in healthcare planning is the spatial dependency of health related factors. GIS adds the dimension of geographic analysis to information technology by providing an interface between data and maps. So, GIS can be effectively used as tool for decision making in relation to optimum gainful utilization of available of medical resources.
GIS techniques provide a set of tools for describing and understanding the spatial distribution of healthcare facilities, evaluating accessibility and barriers to health care delivery, conducting diffusion analysis, health catchment area, conducting epidemiological studies and diseases monitoring and management, conducting network analysis to provide an efficient route and it also find out New areas for improvement of health facilities and Creating a map of health infrastructure. A GIS integrates common database Operations, such as query and statistical analysis, with the ability to see how data relates in space and time. GIS allows analysis of data generated global position systems (GPS) combined with data from surveillance and management activities. The combining of GIS and GPS enhances the quality of spatial and non spatial data for analysis and decision making by providing an integrated approach to disease control and surveillance at the local, regional and national (Naphtali 2005).

1.9 Importance of the study

The Scope of the present study is to study the Spatial Distribution Patterns, Accessibility and Utilization of healthcare services that is normally available in Mysore district. It will be pioneer work in the field of Medical Geography. The present research has been made an attempt to analyze the aspects of availability, accessibility, affordability of health services in the study area. These are the important strategies which are common to poverty improvement and health for all. Thus, the spatial distribution of public health centres their structure and hierarchical level of functions in the district, have attracted researcher to concentrate and to study the resources available the study area. The study focus on accessibility and utilization of health services to identify the gap in the availability of infrastructures and the distance accessibility to the service in reference to the prescribed norms. Since the inception of the minimum needs program, a majority of the villages are still kept far away from the healthcare services. In this point of view, improvements are needed in human resources and socio-economic developments. The population characteristics and socio-economic characteristics are important factors for utilization of health care facilities. So here an attempt has made to investigate the movement pattern of seekers and their preferences to avail the need based health services in order to determine whether there really exists a balanced provision of
need based health services available from the primary health centres to higher order health centres for specialized health care services in the district. Health is also responsible in terms of access to community and primary health centres. Therefore, keeping all these aspects in mind the researcher has undertaken the research by choosing a topic entitled “Accessibility of health care services and its utilization in Mysore district” are part of present study. Thus, the study will be helpful for planners, policy makers and a health administrator to improve the study area where there are more requirements of health services is necessary.

1.10 Statement of the Problem

The selected topic Health it is a basic needs of the people, as well as it has been considered as the indicator of economic development of region or country. Various types of health services are available in the study area and are not adequately distributed throughout the area. The healthcare resources and accessibility it’s varying from one region to another region and health centres are organized in hierarchical order over the space. The order of health services centres is determined by many factors like, size, number of functions it performs etc. To understand the health problems, one must look into various factors such as, epidemiological profiles of diseases, current conditions of healthcare centres distribution, accessibility, Physical infrastructure, Health Workforce. In addition to these factors like Geographical, social, economic, cultural and political factors which affect the distribution of health resources are of very importance in the distribution, accessibility and utilization of health centres. These health centres are close to rural mass and they provide basic facilities required for transformation of rural habitat. These health centres should be made accessible to the rural surroundings, so that the process of development can spread easily and quickly. But what is the pattern of distribution of health centres over the space? How effectively can these facilities utilize by them? Are some of the important questions to be tackled in the present day context? Now a day, we have qualified doctors and health workforce in the urban areas but the rural areas are left at the mercy of less qualified and least interested health workforce. As a result, quality of healthcare is still a dream to poor. Although a good number of researchers have put efforts to identify the factors responsible for the difficulties in health
care services system, yet there are some dimensions, which are to be explored. There is a growing socio-economic inequality between rural and urban population and also inequality in healthcare services in rural and urban region. Thus, there is a need to study the present system of public health care services, gaps in requirements’ of healthcare resources in the rural of study region.

1.11 Objectives

The present study aims to analyze the accessibility of healthcare services and its utilization in mysore district. The present health system has given more importance to preventive, curative and promotive aspects of health. Preventive and promotive aspects play an important role in health services and this services how the people will utilize, this was intended to analyze the patient’s opinion about the existing and functions of public healthcare centres. It also aims to analyze the four important dimensions of public health care services. They are:

- The type of health services existing in the study area.
- The type of health infrastructure and workforce facilities provided by public health centres.
- The extent of public health care accessibility to the people belonging to different society.
- To what extent the services provided by public health centres are utilized by people.

**Based on these points the following objectives of the study are made:**

- To examine the Distribution of existing healthcare centres in the Study area.
- To examine the spatial distribution pattern of health care resources and infrastructure in the study area.
- To Analyse the physical accessibility of Public health centres in Study area.
- To Analyse the Utilization patterns of public healthcare services in Study area.
1.12 METHODOLOGY

1.12.1 Research Design

1.12.1. a. Data Base

The present study is based on from Primary and secondary sources of data. The primary source of data has been collected by questionnaire through the field survey by visiting all the Health Care centres. Though the questionnaire had two parts, one part of questionnaire contains the health care facility survey; it contains the information related to availability of health care infrastructure and health workforce facilities. The other questionnaire contains the patient survey; it contains the information regarding the utilization of healthcare services by the seekers.

The Secondary data related to health care centres are collected from various offices like District Health Office and Taluk Health Office, Municipal Corporations. Population Data are collected from Census Office Bangalore for the Year 2011. The other secondary data are collected in the form of published works such as, Books, Gazetteers, Journals, Articles, both National and International reports published by the Government collected through the Libraries and website also. Along with that, the basic information related to location, extent and physiography are collected from Toposheets. The collected information has been compiled and put in the form of maps and tables for further analysis.

1.12.1. b. Methods of Data collection

The Secondary data with regard to number of public health institutions like District Hospital, Taluk/General hospitals, Community hospitals, Primary Health Centres, Primary Health Unit, Maternity hospital and Mobile health unit, Ayurvedic Hospital and Unani Hospital were collected from the District Health Office, Mysore. Though, this information was available in the secondary literature in the form of hand book published by District Statistical office, Mysore for up to date information visit was made to District Health Office.
The Primary data includes both the personal observation and interview method. All the public health care institutions were visited for collecting the necessary data related to health care system, health workforce, and health Infrastructure facilities like Service Availability, Manpower and Physical infrastructure facilities like mode of transport vehicle, supply of equipments for minor operations, number of patients visit the health institutions in day, etc., the required information of these aspects collected from doctors through the questionnaire method. Meeting the doctors at the time of filling the questionnaire was a kind of personal interview to get more information regarding the problems existing in the Health centres.

The other part of the questionnaire contains the information regarding the Patients socio-demographic and economic factors, like age, gender, education Status, Occupation, income, distanced travelled, mode of transport, nearest health facility, whether the participants receiving all the health care they needed, etc., were collected through questionnaire prepared for the patients. To fill up the questionnaire II (as shown in the appendix I) 10 to 15 patients were selected at random among the patients visiting the health institutions in a day for medical treatment. While selecting the patients for filling up of questionnaire, age group, sex and distance travelled by various modes of transportation were considered. Since the majority of the respondents were illiterate, questionnaire were filled through interview the patients.

1.12.1.c. Sampling design

Sampling is the process by which samples for study are chosen like smaller samples selected from larger population. For the present study Simple Random Sampling (SRS) was used for collecting the information from the patients through questionnaire different health centres were selected from each taluk of the district. All the 6 existing Taluk/General health centres have been selected for conducting primary survey. Taluk/General hospitals attract more people as they are located in the taluk head quarters. Of the total 7 taluks Mysore taluk being an important taluk with mysore as an urban centre has got District hospitals attached with medical colleges which are considered as fully equipped hospitals. Hence Taluk/ General Hospitals do not exist in mysore taluk. Though, all the 8 existing community health centres have been selected for conducting
survey. Of the total 7 taluks Periyapatna and Hunsur taluk not have a community hospital, except these two taluks in the district, remaining taluks have community hospitals totally 8 Community health centre which are selected for primary survey. District consists of totally 135 Primary health Centres, since district consist larger number of Primary health centres simple random sampling method was used for conducting survey. In the sampling of Primary Health centre totally 14 (10%) health centres have been selected from all the taluks of the district for conducting primary survey. Based upon this sample size and other assumptions, calculations were performed to indicate a range of findings.

From the 29 selected public health institutions 350 patients were selected of different age groups, who attended the public health centres at the time of interview. They have been interviewed using a questionnaire with a distinct number of questions in each of its section questionnaire –II (Appendix-I).

1.12.2 Design of the Study

The study is aimed to analyze the “Accessibility of healthcare services and its utilization in mysore district”. To study the distribution pattern of existing health care various Health care centres were selected on the basis of hierarchy or functions performed by them. Both Private and Public health care centres were considered for distribution. But, the study is mainly focused only public health care centres for further analysis. The Spatial distribution patterns of healthcare centres are analyzed with the help nearest neighbor method. By using the questionnaire -1(Appendix-I), the scholar has visited all the public health centres of mysore district, to find out the health services and facilities which are offered by these centres. Simple percentage and ratios calculations have been worked out for all the existing health care centres, health infrastructure facilities and health workforce.

To study the distribution of health care centres geo spatial techniques have been adapted. The Spatial Data Such as, Toposheets of the study area at a scale of 1:50,000 are collect from Survey of India and to generate the spatial village maps involves the extraction of district and taluk boundaries from topographical map. The study area is
covered by 20 topographical maps 57 D-2, 57 D-3, 57 D-4, 57 D-6, 57 D-7, 57 D-8, 57 D-11, 57 D-12, 57 D-15, 57 D-16, 58 A-1, 58 A-5, 58 A-6, 58 A-9, 58 A-13, 58 A-14, 57 H-3, 57 H-4, 48 P-14 and 48 P-15. By using these scanned top sheets, it has been geo referenced and Mosaic in Arc GIS 9.3 software. These maps were then digitized and brought to real world coordinate system after projecting the maps to polyconic projection system. Location of different healthcare centres will be mapped with the help of Global Position System (GPS).

Accessibility is a complex indicator that reflects the number of health care institutions, their geographical distribution and the impact of different types of barriers (social, Economic and culture). To study the physical accessibility of health care centres the role of geospatial technique are important. The Physical accessibility it’s a method of estimating health facilities by the population coverage, time to travel and distance to the closest hospital, etc,. In the study area number of community Health centres is only eight. Therefore, the physical accessibility of people to (PHC’s & CHC’s) has been shown together has both they are providing the basic health facilities. To study the physical accessibility of Public Health Centres in Mysore district, the service area of each PHC has been delineated by using different GIS tools. The actual service area has been demarked to show the population of each PHC. The buffer analysis has been applied to show the served and unserved area in the study area. In accessibility chapter the Primary health care centres a radius of 5 and 7 kms given around the hospital to depict the catchment area of the each health centres. Thiessen polygons have been used to demarcate the service area; it creates a polygon within a polygon. It helps to understand number of villages and population within specific range from the health centre. For the network analysis, the road network of the district has been converted into network dataset. Depending upon the road hierarchy and characteristic, roads were allotted an average vehicular speed. The speed limits for different types of road like, National Highway 50 Km/h, State Highway 40 km/h, Metaled 30 Km/h, un-metaled 20Km/h and Pedestrian as 10 Km/h. On the basis of the speed, travelling time and travelling distance, the service areas and closest facilities both in terms of distance and time were calculated. GPS has been used to locate the PHC of the study area and the population of the settlements has been collected from census. Since the population is not distributed
uniformly across Settlement polygons, the settlement centroids were considered as a demand points, and the PHC facilities were considered as destination points (supply). The population of each service area (Distance and Time), were calculated. Similarly the closest or shortest route has been generated both in terms of distance and time. The population of different shortest routes of PHC’s has been calculated.

To study the utilization pattern of public health care facilities primary survey has been conducted in study area. The patient survey has been carried out through questionnaire to known the utilization pattern and service availability of public health centres. The survey has been conducted in twenty nine public health centres that are randomly selected; in all these centres sample of 350 patients was selected. Thus, the sample is widely scattered and represent different parts of district. The samples were selected randomly and interviewed using a custom-designed questionnaire -II (Appendix-I), with a distinct number of questions in each of its sections. Specially, the questionnaire indicates the socio-demographic and economic characteristics of the patients to know the utilization pattern of health care services in different social classes of population. In the present study the Andersons model of utilization has been applied to predict the utilization pattern of health centres of the study area. The collected data have been analyzed using SPSS 20 using descriptive statistics (Cross Tabulation), analysis of variance and one way Anova test has been done for all variables extracted from the questionnaires.

Graphical representation and charts have been created to illustrate the results of survey data are analyzed.

1.13 Organization of the Thesis

The Present research work is organized into 7 chapters.

The first chapter includes the introduction of the Health, Healthcare Resources, Role of GIS in Health care, Scope of study, Statement of the problem, Objectives, Methodology, Organization of the thesis and limitations of the study.
The second chapter is devoted to an exhaustive review of related literature. Based on the objective review as done in three levels i.e., Global, National and State level.

In the third chapter, an attempt has been made to give the description of the study area. It gives information about geographical setting of the district and in the second part socio-economic structure, demography, agriculture, industry, transport and communication and other aspects of the district.

In chapter four, an attempt has been made to identify the available health care centres their spatial distribution and Hierarchical distribution of health care centres in the study area. Focusing on availability of infrastructure and health workforce of health centres has been discussed and their ratios to population have been carried out to identify the gap between the execution of health care centres and the requirements’ to the population. The spatial distributional pattern of health care centres is analyzed by using nearest neighbor techniques.

The fifth chapter deals with the Physical Accessibility of public healthcare centres in mysore district. Several GIS techniques were used to show the accessibility of health centres like actual service area, buffer analysis, thesian polygon and network analysis were applied.

The sixth chapter deals with the Utilization patterns of public healthcare services in mysore district. For this 29 health care centres were selected randomly. The samples chosen totally 350 patients were selected and have been interviewed using a questionnaire through primary survey. Andersons Model of Utilization has been applied in this chapter to predict the utilization pattern of health centres of the study area.

The final chapter is the summary of the thesis and highlighted findings. The necessary recommendations and suggestions are proposed to give promotion of quality healthcare.
1.14 Limitations of the Study

1. The research study period is confined to 2011 only and study is mainly based on existing conditions.
2. Though the Mysore taluk has got Mysore as urban centre with good hospital, more number of health workforce and infrastructure facilities, the emphasis is given only on the rural areas.
3. The study is confined only to government Public health care centres only.
4. Health Sub Centres were excluded because it is complex, due to time limitation and also they don’t have their own building.
5. Private health care centres services were excluded because it was not possible to collect reliable data from them.
6. In the utilization of health care services studies, result of the study is confined to a random sample of patient’s satisfaction.