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## A LITERATURE SURVEY ON HEALTH CARE SERVICES

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### **ABSTRACT**

*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". 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. 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. The development of healthcare facilities is influenced not only by the healthcare centers, but also by their proper administration and management of health workers. A good healthcare system consist many characteristics like Adequacy, availability, accessibility, affordability and feasibility. As earlier Allopathic Hospitals started in Mysore city were the Krishna Rajendra Hospital in 1876. Krishnaraja wodeyar IV (1902-1940) was first started Mysore Medical College in 1924. Mysore is called as health hub of medical care (Suryanath U., 1988).*

**Key Words:** HealthCare, Utilization, Physical accessibility, Distribution.

### **INTRODUCTION**

In this paper an attempt has to make a literature survey on different aspects of health care such as, Distribution or identification of Health care centers, accessibility, utilization and planning of health care services. The review of literature is an important part of the research in any field. The reasons are that it helps the researcher to know the trends in a particular research and guide him in his research how to proceed in his areas of research. The review of literature related the studies done using GIS have been carried out. It is done by taking into consideration of distribution, accessibility and planning purpose. In addition to this it also facilitates the identification of research problem and the formulation of the objective and methodology of the study. The review of literature gives an account of various studies conducted in the research topic selected that is health care services. The review of literature is broadly divided on four categories.

## A. AVAILABILITY AND ACCESSIBILITY OF HEALTHCARE SERVICES:

The study of regional variations in the distribution of social services (like healthcare) has captured the interest of geographers, planners and other scientists because of their general interest in the spatial variation of phenomena on the earth's surface. In particular, the question of access to sources of human need or want satisfaction stresses the importance of location and distance. Traditional focus of empirical studies on facilities in general, is on the relationship between distance and pattern of the facilities.

**Ashok Vikhe Patil, (et.al) (2002):** In their paper on “Current Health Scenario in Rural India”. They attempt to analysis critically the current health status of India, with a special reference to vast rural population of the beginning of the 21<sup>st</sup> century. The author concentrated to improve the prevailing situation, the problem of rural health both in macro and micro level in a holistic way, to bring ensure good health for poorest of population. He applied the model that, a paradigm shift from current ‘biomedical model’ to a ‘socio-cultural model’ is required to meet the needs of the rural population. **Shashidhar S.Mathapati (2002)** made a study on “Environment and Health in Belgaum Division of Karnataka State- a Spatial Analysis”. He attempts to explain the Environment conditions of the study area to know the prevalence of various diseases and causes of the diseases are linked to the geographical surrounding and to the socio-cultural factors. He also concentrates on Utilization pattern of healthcare facilities to minimize the health problems. The study is confined only to the government health centres and major diseases their causative factors. Author concluded that, the present research has done in improving the health literacy and provide better facilities for improvement of public health by proper planning, organizing and establishing of the healthcare system both in rural and urban areas. **Luo Wei and Wang Fahui (2003)** “Measures of Spatial Accessibility to Healthcare in a GIS Environment: Synthesis and a case study in the Chicago City”, in this article the authors have Synthesized two GIS- based accessibility measures into one frame work and applied the methods to examine spatial accessibility to primary healthcare in the Chicago ten-country region. In this article author used Floating Catchment Area (FCA) method which defines the service area of physicians by their surrounded demands. The gravity-based method considers a nearby physician more accessible than a remote one and discounts of physician's availability by a gravity-based potential. Here former is a special case of the latter. Based on the 2000 census and primary physician data, this article assess the variation of spatial accessibility to primary care in the Chicago region and analysis the sensitivity of results by experimenting with ranges of threshold travel times is a FCA method and travel friction co-efficient in the gravity model. **Shankar. K.N and Sathish Selvakumar (2003)**, have worked on “Spatio-info Health map- A Health GIS application”, in this article the author analyzed to implement a custom GIS application which would be an interactive spatial

analysis tool enabling the health officer to perform re-distributing, re-locating health jurisdictions for effective utilization of health infrastructure. Methodology was done in two phases, phase-1 activity was to create the health jurisdiction for the entire Karnataka state, created a template and sent to each District Health Office to collect PHC and Sub-Centre data. This list was mapped to the village boundary and entire PHC & SC jurisdiction was compiled. Phase-2 activity develops a custom GIS software specific to the needs of the Health Department. Based on the uses requirements specification document was prepared and circulated with the department for feedback and approval. Outcome of this robust GIS software with specific tools catering to Health Department.

**Gary Higgs (2004):** “A Literature Review of the Use of GIS-Based Measures of Access to Health Care Services”: In his article he attempts to analyze the use of GIS-based measures in exploring the relationship between geographic access, utilization, quality and health outcomes. The varieties of approaches taken by him concerned with testing out the relative importance of geographical factors that may influence access are examined. He also concentrated on critically evaluates the situation with regard to the use of such measures in a broad range of accessibility studies using GIS and GPS. However, this review of the literature has also drawn attention to the different definitions attached to the term accessibility in health concept it highlighted some conceptual issues with the application of GIS. **Luis Rosero-Bixby (2004):** wrote an article entitled-“Spatial access to healthcare in Costa Rica and its equity: a GIS-based study” this article reports a GIS based analysis of access to healthcare by the Costa Rican population according to 2000 census. He discuss that, it is important to know the supply and demand of health services and to understand how these two factors converge in accessibility of health services for the population, in order to monitor and evaluate the impact of current reforms in the health sector in the study area. The author has concluded by studying the map of access to health services allowed to identify geographic inequities and to pinpoint specific communities in need. He has shown the study region need to centrally organize a complete healthcare by feasibility of using GIS technology for monitoring and evaluating the reform process and to optimize decisions on location allocation to make access more equitable. **Mark F Guagliard (2004)** has studied the “Spatial accessibility of primary care: concepts, methods and challenges”, He analyze the basic concepts and measurements of access, provides some historical background, outlines the major questions concerning geographic accessibility of primary care, describes recent developments in GIS and spatial analysis, and presents examples of promising work. **Wei Luo (et.al) (2004):** They contributed a joint paper on “Temporal Changes of Access to Primary HealthCare in Illinois (1990-2000) and Policy Implications”. In this paper the authors have examined temporal changes of access to primary health care in Illinois “between” 1990-2000, by using GIS. Census data were used to define the population distribution and related socio economic data were used to measure the non spatial access. Both the spatial and non spatial data were used to access the

primary shortage areas. By this study the author identify that spatial accessibility to primary care are majority of the state was improved from 1990-2000. Areas with worsened spatial accessibility were primarily concentrated in rural areas and limited in urban areas, mainly because of population with high scores of socio economic disadvantages and socio cultural barriers, and healthcare needs. He suggest to improving those disadvantaged population groups for the success of future policies. **Fahui Wang & Wei Luo (2005)**, have worked on “Assessing spatial and non-spatial factors for healthcare access: towards an integrated approach to defining health professional shortage areas”, in this article authors have discussed about Spatial access the importance of geographic barrier between consumer and provider, and non-spatial factors include non-geographic barriers or facilitators such as age, sex, ethnicity, income, social class, education and language ability. A two-step floating catchment area method is implemented in Geographic Information Systems is used to measure spatial accessibility based on travel time. Secondly, the factor analysis method is used to group various socio-demographic variables into three factors: (1) socioeconomic disadvantages, (2) socio-cultural barriers and (3) high healthcare needs. Finally, spatial and non-spatial factors are integrated to identify areas with poor access to primary healthcare. The research is intended to develop an integrated approach for defining Health Professional Shortage Areas (HPSA) that may help the US Department of Health and Human Services and state health departments improve HPSA designation.

**Michael Black (et.al) (2005)**: have worked on “Using GIS to Measure Physical Accessibility to Health Care”. In this article they have analysis two possible methods for measuring and analyzing physical accessibility to health services using several layers of information integrated in a GIS. These methods are presented and compared in relation to a particular public health problem in Central America; they selected only PHC to identify accessibility problems using GIS. Mainly author discussed the benefits for better health planning and policy development through the use of this method before describing potential improvement to the models in the future. By this study it will provide information to assist the restricting of health resources for disadvantaged population in their study area. **Carsten Butsch (2007)**, has studied the “Access to healthcare in the fragmented setting of India’s fast growing agglomerations” UNO Summer Academy for Social Vulnerability, in this article author discussed about India’s healthcare sectors, healthcare problems in India, taken Pune as research area, mapped healthcare facility centres. The major finding of the article is the rapid urbanization lead to disparities in the access to healthcare. **M. Nawal Lutfiyya, (et.al) (2007)**: have worked on “A Comparison of quality of care indicators in urban acute care hospitals and rural critical access hospitals in the United States”. In this paper the author was compare the quality of hospital care provided in urban acute care hospitals to that provided in rural critical access hospitals. In this paper cross sectional study analyzed, secondary hospital data were compared and T-test was computed on



weighted data to ascertain of differences were statistically significant. They had taken examples for 8 of the 12 hospital quality indicators the different between urban and rural access hospitals. In 7 instances these differences favored urban hospitals. One indicator related to favored rural hospitals. In findings suggested that there may be differences in quality in rural critical access hospital and urban acute care hospitals and support the need for future studies by highlighting the disparities between urban acute care and rural critical access hospitals. **Allan Brimicombe & Yang Li (2008)**, have worked on “Spatial Analysis of Accessibility to Health Services in Greater London”, the authors have analyze the spatial analysis of accessibility to health and health related services with the objective of contributing such analysis to the modeling and planning of social infrastructure at the level of the Primary Care Trust. The facilities analyzed are: GP Surgeries, dental surgeries, pharmacies, opticians, general hospitals and bus stands (as an example of access to the public transport network). The three techniques of mapping accessibility are used, concentric circles of Euclidean distance around facilities show general coverage of an area and are simple to carryout using standard buffering techniques in Geographical Information System, and Drive time along a road network outwards from a facility is more sophisticated and relies on specialist functionality within GIS.

**Diego F. Angel (et.al) (2008)**: They contributed a joint paper on “Equity, Access to Health Care Services and Expenditures on Health in Nicaragua” (Atlantic Region). They discuss in the study area the basic facilities still large inequities in access and quality of health services across socio-economic groups and regions. Particularly in rural areas poor people who engaged in agriculture they have below-average access to healthcare services and preventive care. The authors have highlighted the problems like long distances, lack of medicines, and high costs are the main constraint. They also face several main challenges in order to improve the health status of its population. Inefficiencies in the allocation and utilization of resources, low levels of financial protection, high expenses for the poor, difficulties in access to and poor utilization of health care services, an unregulated private sector and limited capacity. **Ann Graves (2009)**: has studied the “A model for Assessment of Potential Geographical Accessibility- A case for GIS”: In this paper he made an attempt to identify the need for strategies to improve access to healthcare services and to support improvement of health outcomes in the United States. Because to increase the quality of life and to eliminate health disparities (Social and political issues) in healthcare access and health outcomes. The author also uses the Andersen Behavioral model for health services it provides one approach to access to health services. He concluded that GIS technology can be of great value in health planning, the development of health policies and the allocation of healthcare resources. **Lakshmi.K (2008)** “Rural Health Care Access -A case study of Madurai district”. The study mainly concentrates on Primary healthcare services in village level, block level and their infrastructure facilities in rural areas of Madurai district.

The author made an attempt to identify the gap between the availability and requirement of quality health care to rural areas. It also concentrates the problem areas for improvement of primary healthcare in rural area of Madurai district. **RajivSharma, (et.al), (2009):** They contributed a joint paper on “GIS-Health Infrastructure mapping for Andhra Pradesh State”. In their article they have analyzed the distribution and functionalities of health facilities in a serviceable area with proximity to their respective village using GIS and they also apply web application in health to get accurate information to support in decision making activities like planning infrastructure, to create new facilities based on gap analysis which can be determined on the basis of the spatial distribution of existing facilities. The authors concluded that by the application of management information system, which may further help in analyzing different parameters. Such as, disease spread, disaster management under major health calamities, providing the immediacy of facility form an emergency services.

**Nasser Bagheri, George L. Benwell and Alec Holt (2005),** have worked on “Measuring Spatial Accessibility to Primary Healthcare”, discussed about a new approach for calculating spatial accessibility to primary healthcare services. The results showed the best route with shortest time. **Nagarajan N.S (2006):** has studied the “Health Education among the Rural People in Tamil nadu-A Sociological study”: The study was based on the secondary data. In this article the author discuss the socio-economic status, health education, current policies and programs in Kanyakumari district of Tamil nadu state. Socio-economic plays an important role on the health behavior of the Kanyakumari district and suggests more realistic approaches for promoting the health education among these areas. **Milind Deogaonkar (2004),** has studied the “Socio-economic Inequality and its effect on Healthcare Delivery in India: Inequality and Healthcare”, he attempts to review the effects of growing Socio-economic inequality in Indian population and its effect on the healthcare system. It tries to identify the factors responsible for the difficulties in healthcare delivery in an unequal society and its effect on the health of a society. **Dhanashri.S.Shinde (2010):** has studied the “Spatial Analysis of Health Facilities in Maharashtra’s South Konkan Region”. The study is mainly based on secondary sources. In this article the author discussed about the spatial distribution of various health facilities and formulate the composite health facility index (CHFI) using the ranking coefficient method. By this method they highlighted the glaring disparities. Finally they author concluded in the study area the distributional pattern of medical facilities clearly reveals that only 10% of the total population largely, concentrated in the urban areas is relatively better served, whereas over 90% remains under-served. The accessibility and efficiency of the existing health facilities was evaluated while making future plans for the development of health facilities in the region. **Steve Ebener & Zine El Morjani,** have worked one “Measurement of Accessibility to Healthcare, Part-II: GIS Development”, in this article author tries to explain the design of the catchment area, attached to a particular healthcare provider, is a problematic that requires specific



tools as well as a detailed and reliable database containing the spatial distribution of all the parameters that influence travelling time.

**Price Water House Coopers (July 2010)**, has studied the “Access to Healthcare: Challenges and Solutions”, the author discusses about the healthcare scenario and challenges in access. In this article he briefed about the healthcare system goals, healthcare in India and about the government spending on healthcare, latter studies about access to healthcare is limited by Dysfunctional physical infrastructure, lack of adequate human capital and poor healthcare financing. **T. V. Sekher** has studied the “Health Care for the rural poor: Decentralization of health services in Karnataka, India”. The delivery of health services in India remains poor, particularly in rural areas, due to lack of infrastructure and personnel, financial constraints, lack of awareness, poor accountability and transparency. Though the networks of the department have spread to almost every village, the availability and utilization of the services continue to be very poor and grossly inadequate. The whole idea of decentralized governance is based upon some key factors like people’s participation, accountability, transparency and fiscal transfers. Our observations from Karnataka indicate that placing health services system under the control of Panchayat Raj institutions has resulted in an overall improvement in the services delivery. The health personnel are found to be accountable to people and there is a significant improvement in the attendance of doctors and paramedical staff in discharging their duties under the watchful eyes of the local leaders. This has resulted in better functioning of PHCs and CHCs and improved utilization of public health care facilities. Karnataka provides a good opportunity for Panchayat Raj institutions {PRIs} to demonstrate their capability in improving the health service delivery for the benefit of the poor. The author concluded by saying we need to wait and see how effectively PRIs can be used as a vehicle for better health service delivery. This, to a great extent, depends upon the cooperation, coordination and mutual trust between health bureaucracy and Panchayat leadership. **Divya.S and Chandrashekara.B (2012)**, they contributed joint paper on “Assessing the availability of Primary health care services in Chamarajanagara District using Kernel Density Estimation”. In this paper the authors discussed the availability of Primary health care Centres in Chamrajanagar District using Kernel Density Estimation for assessing population coverage of health services. By using the kernel density estimation they calculated accessibility ratios such as population to Primary Health Centre and Population to Health Workforce. They find out that, the health centres are unevenly distributed throughout the district. The article seeks to build further multiple types of accessibility to assess population coverage of services.

## B. APPLICATION OF GIS IN HEALTHCARE SERVICES

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., 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.

**Charles M. Croner (1996):** “Geographic Information Systems (GIS): New perspective in Understanding Human Health and Environmental relationships”. In this paper the author has explained the GPS, topology, planner, and surface measurements are basic GIS properties which are important tool which is helpful to identify or location the centres of Diseases, and helpful to control and prevention of the diseases to protect public health. **Francisco Escoba (et.al) (1997):** They have contributed joint paper on “The Role of GIS in the Management of Primary Health Care Services”. In this article they have analyzed a brief overview about the current state of GIS applications in the health sector in Australia. The author also concentrated on "GIS for General Practice" in order to locate the spatial area of application of the project, a presentation of the Divisions of General Practice is given. The main problem found in health applications of GIS at a local level is the lack of availability of routinely collected data sets. Some of the ideal solution will adopted for solve the problem.

**Johnson.C.P & Jasmin Johnson (2001),** “GIS- A tool for monitoring and management of Epidemics”, in this paper authors have try to explain the mapping of Public Health Resources, specific diseases and other health events in relation to their surrounding environment and existing health and social infrastructure, such Information when mapped together creates a powerful tool for monitoring and management of epidemics. GIS allows interactive queries of information contained within the map, table or graph. It permits a dynamic maps published on the internet assist patients in automatically reflected on the maps. GIS procure aerial/satellite images to allow information like temperature, soil types and land use to be easily integrated, and spatial correlations between potential risk factors and the occurrence of diseases to be determined. **Thomas C. Ricketts (2003):** “Geographic Information Systems and Public Health”. In this article the author has explained the GIS is not the complete solution to understanding the distribution of diseases and problems of public health, but it is an important way to

illuminate how human interact with their environment or to create health. **Ellen K. Cromley (2002):** wrote an article entitled “GIS and Disease” In his review identifies and summarizes selected studies using GIS or remote sensing to investigate disease, primarily in the United states. The author explains the distribution of disease agents using GIS, how GIS are being used to investigate exposure to disease agents and the crucial link between environmental and disease surveillance systems and GIS based analyses of disease. **Sara L. Mc. Lafferty (2003):** has studied the “GIS and HealthCare”. He has analyzed the recent literature on GIS and healthcare. He attempt to analyze in four sections. The first section discusses GIS research on analyzing need for healthcare. The second section looks at how GIS is being used to study geographical access to health services and to understand disparities in access among population groups. The third section focuses on utilization, emphasizing the use of GIS in analyzing geographic variations in healthcare use. The final section considers GIS applications in evaluating and planning health services. Location-allocation modeling and spatial decision support systems are also discussed. He concluded that that GIS has provided new ways to investigate healthcare needs for small geographical areas, better measures of geographical access to health services and new approaches to analysis and planning services locations. These new spatial behaviors, which can be studied and modeled in GIS, have high priority for future research attention. **Sabasen.S and Raju K.H.K (2005),** have worked on “ GIS for rural health and sustainable development in India, with special reference to Vector Borne Diseases”, in this article the author discuss about deals with the advanced knowledge on the principles underlying the disease transmission dynamics, prediction of occurrence of diseases is possible based on environmental factors and satellite- based remote sensing data discussed about modern tools like remote sensing Geographic Information System(GIS) is handy to address the issues on the disease surveillance, control, monitoring and evaluation. The rural healthcare information system envisaged on GIS domain, this article explains how it eventually facilitates utilization of resources, preventing disease and promoting healthcare, working towards the overall rural development and thereby ensure sustenance of the program me at all levels.

**Sumi Singh (2006),** “GIS Application in Healthcare Facility”, in this article she focused on medical services management and provision of proper healthcare with optimum utilization of available sparse resources in remote areas, integration of multifarious data sets with spatial and statistical attribute to predict the affected areas and generate a disease control model and create models for further research. It enabled to understand current limitations of medical facilities and resources and lead to a solution to overcome this contemporary data with aid of GIS. This also enabled to combine contemporary data with spatial data to provide better medical facilities to the needy people in rural and outreached areas. **Ashok Hanjagi, (et.al), (2007):** In their Paper on “A Public

Health Care Information System Using GIS and GPS: A Case Study of Shiggaon”. In this article the authors explained Health data, maps and GIS are important resources for health planning and health services delivery particularly at local level. Here, spatial distribution of health status determinants and indicators are studied to improve the health of residents. Here, author found that shiggaon is not lacking of hospitals and clinics these facilities are not well equipped to prevent occurrences of some diseases and also suggest to providing the essential infrastructures and it's needed to implement the integrated health programme in the study area.

**Mesgari.M.S & Masoomi.Z (2008)**, have worked on “GIS Applications in Public Health as a Decision Making Support System and its limitation in Iran”, the authors have tried to study and evaluate the experience on applying GIS in Public Health, the obstructions and difficulties of using GIS in decision making concerning public health, in special situation of IRAN, are examined and some suggestions are proposed to overcome such problems. Here, two applications of GIS in public health affairs are implemented using the data related to the death counts caused by cancer in IRAN. **Najafabadi A T (2009)** has studied the “Applications of GIS in Health Sciences” In this article the author has analyzed the importance of GIS. The author explains the GIS aids in faster and better in health mapping and analyzing than the conventional methods. It gives health professionals quick and easy access to large volumes of data. It provides a variety of dynamic analysis tool and display techniques for monitoring and management of epidemics. GIS serves as a common platform for the convergence of multi-disease surveillance activities. GIS has a vital role to play in the future. The possibilities that can be explored are limitless, depending on the skill and imaginative use of the researchers and the willingness of health sector management to resource its implementation. It helps the Health administrators, professionals and researchers need training and user support in GIS technology, data and epidemiological methods in order to use GIS properly and effectively. GIS helps generate thematic maps that depict the intensity of a disease or vector. GIS can identify catchment areas of health centres and also locate suitable sites for a new health facility. GIS allows interactive queries of information contained within the map, table or graph. It permits a dynamic link between databases and maps so that data updates are automatically reflected on the maps.

**Shenoy (1997)** has studied the “Determinants of health care service Utilization in Kerala, he attempts to analysis Utilization patterns and factors determining the utilization of both private and public health care services by using cross sectional study in both the rural and urban community of Thiruvananthapuram district of Kerala state. The study revealed that out of 4800 subjects from 1001 households consented to participate, 2237 participants had morbidity problem and out of this 1552 utilized healthcare services. Of the total patients utilized health care services, 67% utilized private and 33% utilized public health centres. The utilization of government health

services is very poor in Kerala. The pattern of utilization shows that public institutions are utilized more for inpatient care and for outpatient care majority of them prefer private hospitals or clinics. The study identifies the need for devising strategies to improve the accessibility and utilization of public health care services in a better manner.

### C. UTILIZATION OF HEALTH CARE AND PATIENT SATISFACTION

Understanding of the utilization patterns is required as a shift from input planning methods to output planning, where the actual population and the factors that influence them to use services are inaccessible (Milly Katana, 2005). This study provides insight on what needs to be done to improve the utilization levels. Therefore, it was important to carry out this study so as to promote and facilitate planning based on utilization of services by the patients.

**Ankita Misra, (et.al), (2005):** They contributed a joint paper on “A GIS Based Analysis Of Health Care Services In The City Of Pune”. They attempt to analyze Distribution of hospitals and diseases using GIS, availability and utilization of healthcare facilities in Pune District. The author concluded that healthcare services in the district was well served but in some parts of study area the roads are lacking in hospital services and recommended possible areas for the setting up of new hospitals in Pune District. Shanon et al 1973 Utilization of health services has mainly looked in terms of access, in relation to geographical distance and time. Access to health care services is linked to the distance of the facility and also the time involved reaching there by the ill person.

**Ronald Anderson and John.F.Newman (2005)** have worked on “Societal and individual determinants of medical care utilization in the United States”, they discussed that the healthcare utilization is emphasized by, the characteristics of the health services delivery system, changes in medical technology, individual determinants of utilization. Author explained that these three factors are specified within the context of their impact on the healthcare system.

**Jonathan B. Baker &.Lin Liu (2006)** “The determinants of primary health care utilization: a comparison of three rural clinics in Southern Honduras”: The author have explains that primary healthcare utilization is poorly understood in many parts of the developing world. This is especially true in rural places, such as Santa Lucia, Intibucá, Honduras, where there are only 3 primary health care facilities servicing almost 12,000 people, and generally the author speaking access to care is limited. The author mainly examines the factors that can be used to explain the primary healthcare utilization and aims to improve the understanding of patient utilization behavior.

A better understanding of utilization can be used by health services planner to improve primary health care delivery in this and similar locations. The findings of this research indicate that utilization can be explained, to a large extent, by factors relating to economic status and walking time to clinic. This suggest a strong “distance-decay” of utilization pattern based on estimated walking time to clinics and is consistent with other rural developing world health service research. The author has generally concluded of this research that people attending the government-based rural health centres exhibit distinctly different spatial patterns of utilization than do those who attend the private health clinic. Therefore, the same model should not be used to examine both types of primary care services. This conclusion contributes to developing sound health policy. **Albert Christopher Dhas & M.Helen Mary Jacqueline** (2008) they contributed a joint paper on “Trends in Health Status and Infrastructural Support in Tamil Nadu”. In this article the author analysis the health status in Tamil Nadu and to highlight the major issues on it. The health scenario of Tamil Nadu was examined, based on certain selected health indicators and the extent of health infrastructure available in the state and its utilization were discussed. The author concluded that though the study area seems to have performed better compared to all India average in demographic and several health indicators. But, the demographic indicators and vital statistics indicate very high of Tamil Nadu in term of health performance, there are several areas in which improvements are possible. Particularly, Infant mortality and maternal mortality rates could be brought down further and major diseases could be controlled and reduced further. **Dalal K & Dawad S (2009):** have worked on “Non-utilization of public healthcare facilities: examining the reasons through a national study of women in India”. The study mainly based on Secondary data. In this article the authors examines women’s opinion about their reasons for the non-utilization of appropriate public healthcare facilities according to categories of their healthcare seeking in India. The authors explain that the majority of Indian families do not use public healthcare facilities mainly because of inconvenient and poor quality. So, he concludes that the redistribution of public healthcare facilities will help address established of rural disadvantages. So, improved the quality of care is necessary steps to reducing maternal mortality and poverty. **Wan and Soifer (1974):** “Determinants of Physician utilization- A Casual Analysis”, has discussed the most important factors related to health service utilization are the need for care (illness level) average cost per visit, health insurance coverage and age. Other variables either have an indirect or negligible effect.

**Milly Katana (2005):** has made an intensive study on “Utilization of Formal Healthcare services and Associated factors in Uganda: A Case study of Luweero District”, he argued that the level of utilization of health care service in Uganda remains very low. The low level negatively affects the quality of life of many Ugandans who remains outside the healthcare delivery system. The descriptive cross sectional study was carried out to establish the level



of utilization of health care services among the district, to determine the factors promote or hinder use of health care services in the formal health care system. The author also carried out the study related to establish the types of health facilities through which people got care. The findings of this research indicates to support both district health planners, health managers at the central level, to design better strategies that will improve utilization rates of health care services. **Trish Prosser B Psych (2007):** have worked on “Utilization of Health and Medical services: factors influencing health care seeking behavior and unmet health needs in rural areas of Kenya”. The author studied that factors which influence the use of health and medical services, specifically health care seeking behavior in the study area. The study was conducted in three geographically area of Kenya: one coastal, one semi-arid, and one within the lake Victoria basin, by using questionnaire to achieve demographic and socio economic data, as well as information relating to the activities of people. Multivariate analyses are used in this study. The current study also highlighted the importance of access issues to health care seeking. These factors involved costs associated with seeking treatment, distance and the time taken to travel to health care facilities. The author find out that many people would not use hospitals or health centres or other types of formal care, even though they would prefer to, because there was some access issue, either with the time taken to travel the distance or the type of facility that was closest.

#### **D. PLANNING OF HEALTHCARE SERVICES**

**Ateeque Ahmad, (et.al) (2009):** have worked on “Micro Regional Planning of Health Facilities in Bulandshahr District”: In this article the author discuss about the distribution pattern of health facilities, and levels of development of educational facilities, to devise a micro regional plan for better access of health facilities in Bulandshahr District of Maharashtra. This study is mainly based on secondary sources of data. A diagnostic planning has been proposed based on qualitative and quantitative methods are used in this article to achieve the goal of attaining balanced regional development. The author finded by keeping in view the number of facilities existing in 2001, he proposed the number of health facilities for 2021 to achieve the balanced standard of functional level for growing population. **Sophie D. Lapierre (et.al) (1999):** have worked on “The Public Health Care Planning Problem: A Case Study using Geographic Information Systems”. In this article the author focuses on the problem of designing new networks for the delivery of public healthcare services in the United States. This paper is based on a case study design conducted with the Fulton county health department. They studied in two folds; first, it presents a planning methodology to delivery of healthcare services through a mix of fixed health centres, satellite facilities and mobile facilities. Secondly, it gives insights on how to use GIS to designs new health care services network. The author concluded that by using GIS it become a basic for

planning. **Abdul Kader A. Murad (2001)**:“Application of GIS in health care facilities planning”. The study was based on the both Primary and secondary data. In this paper he made an attempt to identify available healthcares (government hospitals) and spatial distribution of diseases using GIS and discusses the accessibility, utilization of healthcare in Jeddah City Saudi Arabia. The author also discusses the spatial changes in health status and defined a set of criteria for the planning of new hospital locations. Author concluded that by using this GIS application, health planners can allocate areas of the city which having poor accessibility to hospitals and according, a decision regarding improving hospital accessibility can be easily and quickly reached.

**Roger Strasser (2003)**:“Rural health around the world: challenges and solutions”. In this article the author has discussed that the major challenges facing rural health around the world, he reviewed the problems, he attempted to analysis that the immense challenges are taken for improving the health of people of rural and remote areas of the world and initiated a specific action plan are taken like, The Global initiative on rural health plan. The health for all rural people is too achieved through the concentrated efforts of both international and national working peoples like doctors, nurses, and other health workers in rural areas around the world to give “Health for All Rural People” it focused world attention on rural health and marked the beginning of a new era for improving the health and well-being of people in rural and remote areas of the world. **Hilary Graham and Micheal.P.Kelly (2004)** “Health Inequalities: Concepts, frameworks and policy” in this article author tried to highlight some of the conceptual issues relating to socio-economic inequalities in health. The first section discusses how people have been classified in the UK and how, using the traditional measures to socio-economic position, the challenge of health inequalities is being addressed. The second section focuses on ‘determinants’, a core term in the drive to reduce health inequalities and discusses the difference between determinants of health and determinants of inequalities in health. The distinction between the idea of health disadvantage, health gaps and health gradients is explored in the third section. The paper therefore makes explicit some of the key terms used in the debates about health inequalities to help inform the process of policy development. **Tullio Jappelli, Luigi Pistaferri & Guglielmo Weber (2006)**, have worked on “Health Care Quality, Economic Inequality, And Precautionary Saving”, in this article authors have analyze the exploit district-wide variability in health care quality provided by the Italian universal public health system to identify the effect of quality on income inequality, health inequality and precautionary saving. They find that in lower quality districts there is greater income and health dispersion and higher precautionary saving. The analysis carries important insights for the ongoing debate about the validity of the life-cycle model and interesting policy implications for the design of health care systems.

**Koutelekos John & Photis N. Yorgos (2008)**, have worked on “Primary Care Clinic Location Decision Making and Spatial Accessibility for The Region of Thessaly”, in this article the authors discussed about the determination of the optimum location for the construction of the proposed medical centre for providing high level services in the Thessaly region, by implementing quantitative methods of Spatial Analysis of GIS technology. Spatial Analysis focuses on evaluating existing and proposed models of spatial organization, while GIS, provide the necessary informational tools for the elaboration and management of the relevant information and all in all in the support of the relevant decision making process. **Nasser Bagheri (et.al) (2009)**: have worked on “Using Geographically Weighted Regression to Validate Approaches for Modeling Accessibility to Primary Health Care”. The authors analyze the local variation in accessibility to primary health care and relationship between travel times in New Zealand. Geographically weighted regression (GWR) method was used here. The author finally suggests that by using this GWR model is better application to explore local variation in accessibility for PHC. Finally, by using this model the outcome to evaluate the access and planning to poor accessibility to PHC facilities in rural area. **Anuj Bariar, (et.al), (2004)**: In their paper on “Development of GIS Based Spatial Data Infrastructure for Micro-Level Planning”. In this article they focus on the development of spatial data infrastructure at village level for a part of Allahabad district of Uttar Pradesh state under GIS environment. They made an analysis of the Allahabad district infrastructure facilities using GIS it is helpful in the planning and development of rural infrastructure. Finally they have found by observing the maps that there is a urgent need for setting up more schools and enhancing health services in the shankargarh block of Allahabad district. A GIS based spatial data infrastructure has been developed for a part of Allahabad District in the present work for planners and decision maker for making more informed decisions. These will be useful to administration and resource mobilization as well as help in decision-making for micro level planning.

## CONCLUSION

The literature survey on health care services reveals it is a very dynamic in nature in its all aspects. The review of literature has been arranged in a very systematic order. It has helped to understand the definition of health care services, GIS and Health care, health inequalities and health service utilization etc., in India and abroad. From the review, it is clearly indicate that majority of definitions and geographical access models help to understand the service quality of health care centers by comparing the patient’s expectation on the service quality. By the use of advance GIS tools it provides the researchers and planners to visualize and conceptualize the health plans and policy.

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