Health, like peace is indivisible. World health involves the health of all the peoples of the world rich and poor in whatever stage of development. The affluent nations have reached the status of health in which the communicable diseases and nutritional disorders are overcome but degenerative diseases, cardio-vascular diseases, malignant diseases and mental ill health still require great attention. India is a developing country with much poverty, ignorance and disease and a great mortality due to communicable diseases and nutritional disorders. The world health organization is doing so much to so many people in health development and the conquest of disease (Rao, 1968).

The term 'Health' has been defined by the world health organization, as "a state of complete physical, mental and social well being of the individual and not merely the absence of disease or infirmity (1972). All those factors manifest in our surroundings, our food, genes and material well being are more important than the pathological factors. J.M. May has truly identified the..."
environmental and pathological factors as geogens and pathogens respectively. Study of geogens in the dimensions of space and time is known as geomedical study (1950).

World health organization adopted the global strategy "health for all by 2000 A. D." and it was later endorsed by the United Nations General Assembly and stressed the need that every individual to lead a socially and economically productive life (WHO / UNICEF, 1978).

For the growth of economy in any country, health forms a major contribution. Obviously the relationship between socio economic development and progress of health is of extreme importance. Infact, every aspect of economy has a health component which has an important bearing on the overall socio-economic development (Seal, 1971). The major areas in which health affects socio-economic development include problems arising out of the rate of population growth, rapid industrialization, urbanization, mental stress, social instability, environmental pollution and the growing disparity of living standards within and among nations. The promotion of health cannot be achieved by measures that derive from any single health discipline. Health is largely depends on levels of nutrition, housing conditions, environmental hygiene, personal hygiene, socio-economic status, social security, health education, organized public health and medical care services.

Review of Literature

The kinds of diseases through man-environment relationship has engaged the attention of geography and paved the way for the evolution of
medical geography as a distinct discipline of geography. The contribution of medical geography towards health and health care is the understanding of the geographical background of the people and their living styles which includes climate, soils, topography and vegetation of the human settlements, food habits and personal and environmental hygiene.

To explain the spatial distribution and incidence of certain diseases in the beginning, some aspects such as population growth and its variability in birth and death rates, infant mortality, food habits, socio-economic, cultural and religious factors, seasonal and regional variations in climate, water logging conditions, availability of essential services and amenities were served.

In the later period, studies were of origin concerning with the associative occurrence of diseases in relation to various environmental and socio-economic factors. To explore further partition and relationships with suitable empirical verifications, quantitative research tools have been used.

Learmonth has studied significant regional differences and regional groupings in the distribution and incidence of certain diseases which are present in the period, the number of people affected by each disease, the geographical variation in the distribution of diseases, the section of the community which is effected by each disease, whether the disease is more wide spread at certain season, the nature of each disease its virulence and endemic or epidemic frequencies.
Akhtar (1986) stated that the levels of health and disease vary between places and over time. So, awareness of the importance of understanding the geographical aspects of problems of human health is essential to study in medical geography.

The initial contribution towards health and health care delivery system by medical geography has come to limelight only after making attempts to prepare disease maps and atlases showing the distribution of diseases. It is thus the disease mapping is recognized as an important tool of research in medical geography. Considerable work on these lines was done in Germany, France, Russia, Latin America, and USA. Realizing its importance, the International Geographical union constituted a commission on medical geography and its first report was discussed at the IUG congress in Washington, 1952. The commission defined medical geography as “the study of geographical factors concerned with cause and effect of health and disease”. Since then the analysis of health and disease became popular.

Learmonth studies on medical geography thrown more light in the field. They are, The study of twenty years of medical data of former British India (1958), Medical geography in India and Pakistan (1961), Ecological medical geography (1975), Patterns of disease and hunger (1978), Geography of health (1981) and The geography of health, a prologue (1984) etc.


In medical geography, medical cartography has become an important part and has contributed much to our understanding of the spatial aspects of human health problems. Maps of disease have been produced by medical geographers to bring out spatio-temporal variations, in the form of atlases (Gilbert, 1958, 1972; Howe 1963, 1970, 1970b, 1972; Forstor 1972; Pyle 1972; Learmonth 1978).

Probably the first scientific attempt to identify the regional factors associated with the prevalence of diseases in India was made by McClelland (1859). Later on Macnamara studied in detail the geographical factors influencing the occurrence of various diseases, particularly goitre in the Himalayan and sub-himalayan regions (1880). Besides, Joseph Fayrer's 'climate and Fevers in India' (1882), the diseases of India (1886) by chevers and Moore's Tropical climates and Indian diseases (1880) are also pioneering efforts in this direction.

The foundation of modern medical geography in India was laid down in the 1930's. The 21st International geographical congress, which was held in New Delhi in 1968, provided an encouraging opportunity to Indian geographers to contribute and present papers on various aspects of medical geography.
geography including medical geography. R P. Misra's Medical geography of India (1970) is a systematic piece of work that helped many geographers in India.

Studies particularly on the spatial distribution, variation and mapping of distribution of disease were made on malaria by James (1902); Christopher and Sinton (1976); Iyengar (1930-31); Hyma and Ramesh (1976); Leamonth (1977, 1976); Dutta et al (1979). Cholera was studied by Swaroop (1951); Seal (1960); Hustary (1968); Basu (1969); Banerjee and Hajra (1974). The studies on cancer diseases were contributed by Bentall (1908); Junawalla (1976), Akhtar 1979 and Mathur (1981).

A good number of studies on different lines of medical geography like epidemiological studies, diffusion studies, locational and behavioural analysis were carried out by many geographers such as Akhtar (1981), Johnmohan (1983), Anandi Krishnamurthy (1983), Swaminathan (1984), Dakhsa Barai (1984), Ramachandran (1984), Murugesan (1987), Majid Hussain (1993) and Saravanabhavan and Shanmuganandan (1988).

Based on the earlier studies, in the present topic an attempt is made to analyse the spatial patterns of diseases with special reference to malaria in Karimnagar district of Andhra Pradesh.

**Choice of the present topic**

It has been found that detailed studies in medical geography have not been made with special reference to Andhra Pradesh so far. Therefore the present study is an attempt to fill up the gap.
Study area

The present study is confined to Karimnagar district. It is one of the districts of Andhra Pradesh, especially Telangana region. Except Rangareddy and Hyderabad, the districts of Telangana are relatively backward economically and socially so it is interesting and necessary to know the health condition of the people in Karimnagar district.

Objectives of the present study

The following are the main objectives of the present study

1. to study the spatial patterns of diseases
2. to study the spatial and temporal patterns of malaria prevalence and trends,
3. to study the existing health care delivery in brief.

Scope of the study

The present endeavour brings forth the spatial patterns of disease prevalence in the district. It also enlightens about the spatial patterns and trends of malaria in Karimnagar district. A brief analysis of the existing health care delivery system gives an idea about the health facilities available in the district. This will help particularly to formulate suitable plans for better health and also helpful for the health department particularly malaria department personnel to combat with malaria.

Data and Methodology

In the present study, only secondary data were used, collected from the records of the office of district medical and health officer, district malaria
officer, the handbook of statistics, Karimnagar district and Gazetteer of the district. To study the spatial patterns of disease prevalence and the existing health care delivery system, the data were collected for the year 1999 at mandal level. Morbidity data of malaria was also collected for 10 years period (1990 to 1999) at mandal level to study the trends of malaria.

In the present study both statistical and cartographic techniques were used for the analysis of secondary data such as averages, percentages, regression analysis and coefficient of determination were employed. Suitable cartographic techniques were employed to map the disease pattern, some aspects of population, literacy etc.

Organization of the study

The entire study is divided into six chapters. In chapter II, the geographical profile of the study region of Karimnagar district is attempted. The spatial analysis of disease prevalence at mandal level are discussed in chapter III. The prevalence and trends of malaria is enlightened in chapter IV. In chapter V, a brief account of health care delivery system in Karimnagar district is attempted. In the last chapter, summary of the findings is furnished.