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Geographical analysis of heart diseases:Trichirappalli, Tamilnadu, India

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ABSTRACT

The present study analyzed the objectives Analysis of the spatial distribution of heart diseases in Trichirappalli district and identified the spatio temporal variation observed in different types of heart diseases and the diseases pattern in relation to socio economic and cultural determinations were also explained. The Main Sources of data were based on secondary data available at Government Hospital located at Trichy City. The sample of 460 males and 290 females out 750 were recorded during the study period 2004-2005. Demographic and socio – economic variables are collected from the census Report 1991 and also at various levels. The Base Map particulars and related information were gathered from the Trichirappalli Corporation office. The questionnaire information were suitably converted into tables. A simple statistical techniques were extremely employed to analyze the data and determination of the discuss. To explaining the various types of life styles and social aspects of the disease and identification of the spatial distribution ,and finally attempted to summarize the facts and findings of the study and present in a framework towards strengthening the health care measures in an integrated health care delivery system.

Keywords; Medical Geography, diseases pattern, heart diseases and socio-economic variables.

INTRODUCTION

Health is a common theme in most culture and in fact all communities have their concepts of health as part of their culture. The current definition of health is and there is no single yardstick for measuring the health status. Dubas (1952) defined health as “Health implied the relative absence of pain and discomfort and a continues adoption and adjustment to the environment the ensure optimal function”. The World Health Organisation (1948) has defined health as a state of complete physical mental and social well being. Chronic disease and conditions have been variously defined in Euro Symposium in 1957 and attempted to explain the following definition. “An impairment of bodily structure and / or function that necessitates a modification of the patients normal life and has persisted even an extend period of time.

Theoretical base:

Cardiovascular Disease particularly the coronary heart disease are the main cause of death in industrialized countries and is rising at an alarming rate in much of the developing world. Heart Disease and stroke are known as cardiovascular disease, which are disorders of the Heart and Blood vessel system. Coronary heart disease is a disease of the blood vessels of the heart that causes heart attacks. A heart attack happens when an artery becomes blocked, preventing the supply of oxygen and nutrients from getting to the heart. Other cardiovascular disease is high blood pressure, angina (Chest pain) and Rheumatic Heart Disease. Each year about 10 million of the world's people die of cardiovascular disease. Cardiovascular disease presents the leading causes of death in developed countries. (E.g., Europe & North America).

The Socio – economic development and organization occurred and in the risk factors are habits or traits that make a person more likely to develop a disease many of the heart disease can be easily controlled. The risk factors included.

i)Cigarette smoking ii)High Blood Pressure iii)High Blood Cholesterol iv)Over weight
v)Physical inactivity vi)Diabetes

High Blood pressure is also known as hypertension formed as one of the Major risk factors for coronary heart disease High Blood Pressure is also known as the “silent killer” because most people who have it do not feel sick, Blood pressure stays at 140 / 90mm Hg or above is classified as high blood pressure. High blood cholesterol level is yet another important risk factor causing coronary heart disease. The higher the blood cholesterol levels the higher heart disease risk. The other important risk factors are physical inactivity, overweight, Diabetes, stress and excessive Alcohol consumption. Each year about 10 million at the world's people die of cardiovascular disease.

The problem of chronic non-communicable disease is assuming increasing importance among the adult population in both developed and developing countries. Cardiovascular disease presents the leading cause of death in developed countries. E.g. (Europe & North America).

The cardiovascular disease burden that affected so many of the developed countries earlier in the center is more diminishing in many place. The socio – economic development and urbanization occurred an increasing rate of heart disease mortality has been documented in several countries of the world Health Organisation's Eastern Mediterranean region. Such as cyprus Egypt, Iran, Iraq and Jordan (Alwan 1993).

Most cardiovascular disease is brought about by some combination of smoking high blood pressure, elevated blood cholesterol. Unhealthy dietary habits, including excessive alcohol consumption obesity. In India a large pattern of CHD has been reported as follows. Males are affected More than females hypertension and diabetes account for above 40 % of all cases, heavy smoking is responsible aetiologically in a good number of case.

1.2 Scope of the study:

The identification of risk factors of the study areas in relation to the disease can highlight the association of socio-economic and cultural environment factors with the disease. The existing morbidity condition warrants the health situation and health status of the people due to heart ailments. The wider scope is to find out the environment condition disease, stress and life style variables so as to plan for better socio – economic for environmental health care planning. In addition, it also helps to provide the most appropriate description at the present standard at

diagnosis and remedy. Thus the research has also forces the important roles of people in varying social and economic circumstances to protect their heart health. The geographic and socio economic with large swings seen in the occurrence of cardiovascular diseases over short periods may be useful to gear up health education activities specially targeted to heart health program.

Medical Geography:

Medical geography is a multidimensional body of knowledge and at the same time it is a multifaceted approach aimed towards understanding the spatial aspects of human health problems. Medical geography is also known as Noso-Geography (in Greek word “Noso” means “Disease”) or simply geography of disease as referred by German and Russian Scholars in their literatures (Shaskin 1962).

May's (1950) concept put favoured the statement that the application of geographical concept and the techniques to health related problems can also be called Medical Geography.

In 1960's Yerginly and liatger associates defined Medical Geography as the study of the spatial distribution of Health. It can be grouped into three Major categories.

- 1.The spatial analysis of the distribution of human disease.
- 2.The analysis of geographical environments.
- 3.Influence of health.

These three general categories demonstrate a degree of overlap with each other.

A study of Medical Geography from an environment point of information is possible with information deals about the genetic aspects of human health as well as human behavior.

The last few years in Medical Geography has shown an increasing significance relatively in the new field of geography. The Royal Geographical society gave more encouragement to this field. a number of classical of works were prepared under the auspices and a considerable progress was registered in U.K., U.S.S.R., U.S.A and Germany in recent Past, G. Melvyn Howe's (1970) “National Atlas on disease Mortality” showing the Mortality of the U.K Dr. Jacques M.May (1958-61). Stressed the importance of the direction of Medical Geography and the department of American Geographical society of Newyork which published the studies in Medical Geography in 3 volumes viz,

- 1.Ecology of human disease (1958)
- 2.Studies in disease ecology (1961)
- 3.The ecology of Malnutrition in the far and near East (1961).

The studies of the recent past, particularly the Stamp's (1975) books on some aspects of Medical Geography and “Geography of life and death” is noteworthy. Rownstree (1959) by the end of the 19th century placed a great deal of emphasis on poverty as a determinants of health condition in his study on the study of geography of disease (1959). Stimpson (1981) has explained the consumer use of health care services. They Phychological concepts like perception, cognition attitudes and belief factors conceptual development of Medical Geography in India.

Medical Geography in India:

In the earliest works of Medical Geography in India dated back to half of the 19th and the early 20th centuries and were concerned with the distribution and study of a disease on a descriptive basis. For example topography in the Northern part of India was studies by Many Scholars

Meclelland (1859) McNamara (1990) Cheversetal (1886) Adams (1889) and Hamosten (1905). In such similar descriptive vein were later works from southern India on public health at districts level (Hesterlow, 1930, 31, 32; George & Webster 1934) Ramachandran (1937) Sivaramayya (1936), Nityanandan Pillai (1941).

The IGU commission on Medical Geography was formed in 1948. This acquired recognition and subsequently encouragement for the subject was noticed Indian Journals from (1951) onwards.

An individual disease was analysed in details both in regional and national contests Tewari (1968) Ecological factors influencing the different types of cancer in India and has also been a subject of concern for Medical Scientists Sharma (1968). In the field of disease ecology too, the Madras IGU symposium in 1981 revealed the diverse interests of Indian Medical Geographers studies related to the spatial patterns of blood groups in southern India Shanmuganadan (1981) the ecology of tuberculosis (Singh and Singh 1981) the establishment of new focus of schistosomiasis (Anantaraman 1981) and the geographic factors of eye disease (Intrapal & Mathur 1981) were some of the important contributions.

Importance of the present study:

Heart Disease has emerged as one of the most important health problem in India in recent times. The population is exposed to the risk of infection. The recent statistics available for heart diseases revealed 65.4/1000 males 47.8/1000 females were exposed to the risk of heart diseases in urban areas as against 22.8/1000 males and 17.3/1000 females in rural areas (Park & Park 1995).

The studies in Medical Geography are concerned with the description of spatial and temporal variations of a particular disease and are attempted largely at regional levels but limited to micro levels. Hyma and Ramesh in 1976 also noted that “macro level analysis doesn’t actually identify the small endemic foci”. The present study is a piece of research contribution with reference to analysis of spatial distribution and variations of heart diseases in Trichy District. The study is attempted at Micro level relating Trichy district as the study area.

The study attempts to analyse between the interrelationships prevalence rate of cardiovascular disease. Socio – economic, Socio cultural, environmental and demographic factors with an attempt to identify the major dimensions.

1.6.Statement of the problem:

Cardiovascular Disease is largely a Preventable in the world. It is a Non-communicable disease. Cardiovascular diseases are at present occupying the leading cause of death in developed countries (e.g. Europe and North America) accounting of 70 to 75 % of total deaths.

The prevalence of chronic diseases showed an upward trend in most countries. One reason is that the life expectancy is increasing in most countries and a greater number of people are living in older ages and are at greater risk to chronic diseases of various kind, another reason observed for the increase in cardiovascular disease are life styles, and behavioural patterns of people whose behaviour is changing rapidly. In recent times the developing countries are warned to take up appropriate steps to avoid the epidemics of non communicable diseases likely to come with the Socioeconomic and health development.

Review of Literature:

The forces of Globalization poised to affect the health status of large populations of the world and this could be harnessed in a positive way to overcome the major catastrophe if seized upon now. Dr. K.S. Reddy (1997) Professor of cardiology at the All India Institute of Medical Sciences, New Delhi explained that Globalization brings everything including knowledge. He also suggested that a heart disease suggested “Just as western travelers used to look for a comforting Mc Donalds in foreign countries they’ll now be looking for smoke free environments and healthier foods which are compatible with their life style” (Reddy K.S. 1997).

Abdominal obesity and an accompanying constellation of risk factors have been shown to increase the likelihood of CHD as much as 20 fold over normal background risk. (Reddy K.S. 1997).

Dr. Jean Pierre Despres (1997) Scientific director of Lipid Research Center, University Hospital, Laval University Quebec City described that the laval group has identified hyperinsulinemia as a risk factor for CHD “not only for diabetes” and also indicated that hyperinsulinemia is a close correlate of visceral obesity. The heart and Stroke Foundation of Ontario announced that Elgin county was one of the “13 Hot spots” in Ontario for death due to coronary heart diseases (Rubini 1997).

Cardiovascular disease is a Major cause of illness, disability and death. In 1998 41% of all death were attributed to this disease.

Dr. Victor Sidel (1997) distinguished professor of Medicine at Montefiore Medical Centre and the Albert Einstein College of Medicine Bronx, New York said “Throughout the world, both in industrialized countries and in developing nations, it is clear that one of the Major Factors in disease is the Socio – Economic status of the people”.

Dr. Jacques Genest (1997) said that it is well established that there is a causal link between cholesterol and coronary heart disease. The treatment of elevated cholesterol in high-risk individuals has been shown to decrease the total Mortality, coronary mortality and overall health care cost.

Jeremiah Stamler, (1997) Professor, Emeritus, Department of Preventive Medicine, Northwestern University Medical School of Chicago discussed the important key dietary factors which influence blood cholesterol.

“All men and women who have reached the age of 40 since the last visit are invited for screening” Ms. Woien, (1997).

The theme of the international heart Health conference held in 1992 was as ‘Bridging the gap, science and policy in action’ tells the need to do is to unite health professionals, scientists and policy makers at all levels in the effort to implement a global policy for cardiovascular disease prevention.

3. Study area:

Trichirappalli district is centrally located in the state of Tamilnadu. This District is spread over eight taluks with a total geographical extent of 4519.16 sq. Km having the headquarter at Trichirappalli. It is bound on the North East by Prembalur District, North-west by Namakkal District, East by Thanjavur District West by Karur District, South-East by Pudukkottai District

South by Sivagangai and Madurai District. This district lies between 78 °10' to 79 °5' East longitudes and 10° 15 to 11° 2' North latitude. The average altitude of this area is 78 Mts above the MSL (fig 3.1).

The district has a high mean temperature and low relative humidity. The district gets more rainfall from north east Monsoon. Even though the region is not subjected to extreme of climate, the summer months are not quit and difference between maximum and minimum temperature are only moderate. The atmosphere is dry with little moisture during the beginning months of year. This season being cool is pleasant and enjoyable by March the mercury acquires an uptrend. Which is gradual and persistent. The south- west monsoon period lasts till August. The heaviest rainfall occurs during October to December when the north east monsoon sets in. The maximum temperature and minimum temperature are dominant by April to June and November to January respectively. Generally the climate of the district is too hot and dry.

The Predominant soil in the district is red sandy with scattered pockets of black soil. Alluvial sandy loam and loamy soil constitute major portion of the deltaic regions boarding the river cauvery. Sandy loams are found predominantly in Lalgudi, Mannachanallur and Andanallur blocks.

The important river of the district are the Cauvery and its tributaries. Entering the district at western side the Cauvery flows towards the east. The head of Cauvery delta is at the upper anicut 16 Km east to Trichy, Where the river bifurcates in to two. The northern branch, known as the Coleroon is mainly flood carrier and the southern branch retains the name Cauvery.

In this district out of the total geographical extent of 4,40,412 hectares. The various land use patterns have given in table(2.1). 1,89,141 hectares(42.94 %) are used for regular agricultural practices. A total of 78,703 hectares(17.87 %) are kept as fallow lands. The lands put to non-agricultural purpose cover 71,511 hectares. The cultivable waste lands of 28,340 hectares can be made use by suitable package of practices.(fig 2-3)

Trichirappalli district is one of the densely populated district of Tamilnadu. According to 1991 census, the population of Trichirappalli district is 41,38,048 in which male and female population are 20,85,811 and 20,52,237 respectively. The density of Population of the district is about 372.93 persons per Sq.Km.

In Trichirappalli district almost all the taluks Headquarters are having cluster of Urban settlements. These Urban centers are supported by rural settlements and they are in a scatter manner. All the taluk Headquarters are enjoying urban facilities like transport, education, medicine, electrification etc. The city of Trichirappalli is the Headquarter of the district and situated on the bank of the Cauvery river. It is one of the most ancient cities of India.

Trichirappalli district is well connected with a net work of roads, railways and air ways. In this district the length of road is 2368 Km. The important roads are as follows:

N.H.45-Trichirappalli-Coimbatore; N.H.7-Connecting Karur and Dindigul; S.H.8 (State highway)-Trichirappalli-Coimbatore; S.H.6- Trichirappalli-Namakkal

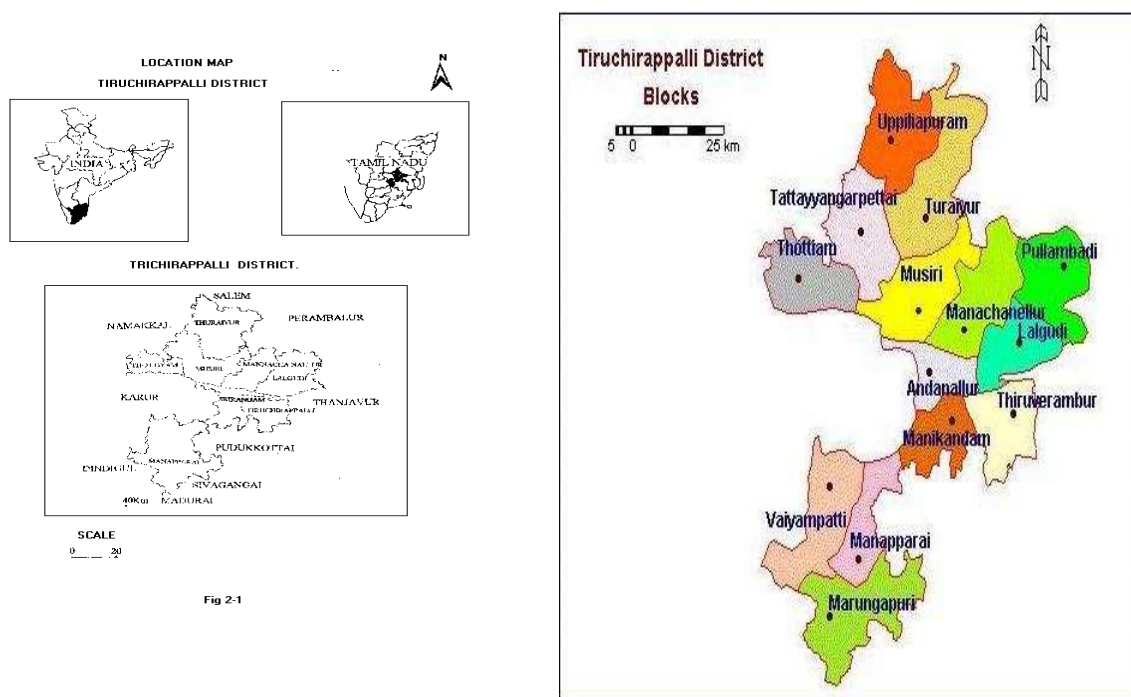


Fig 3.1. Study area

DATA SETS AND METHODOLOGY

The data collection is carefully planned both at primary and secondary levels. As this study involves in the identification of risk factors, the study has stressed its importance to collect the primary data by using a questionnaire survey with the help of suitable sampling procedure.

Primary data collection:

As there is a limitation to have a complete data available from secondary sources it is essential to go for primary data collection to fulfill the gaps exist in the secondary data. Further information available in the case sheets are inadequate the questionnaire were administered among the inpatients reported in the hospital during the period 2005 were collected. The primary data collection involves the administration of detailed questionnaires among the related information the study using the random sampling procedure by direct observation method. A total number of 50 samples were selected both from inpatients and out patients reported with cardiovascular risks. The collection of primary data include Age, gender, educational status, Family size, Marital status, income, occupation, weight, height, food habits, fast food, salty food, alcoholic beverages, diabetes, smoking, blood pressure, cholesterol and glucose levels. Physical activity, psychological concerns, physical activities, mode of travel and health care.

Secondary data collection:

The data related to morbidity and mortality of heart disease were collected. The age wise and sex-wise distribution, bed occupancy rate, socio – economic status, geographic distribution were also collected published and unpublished sources available at the hospital.

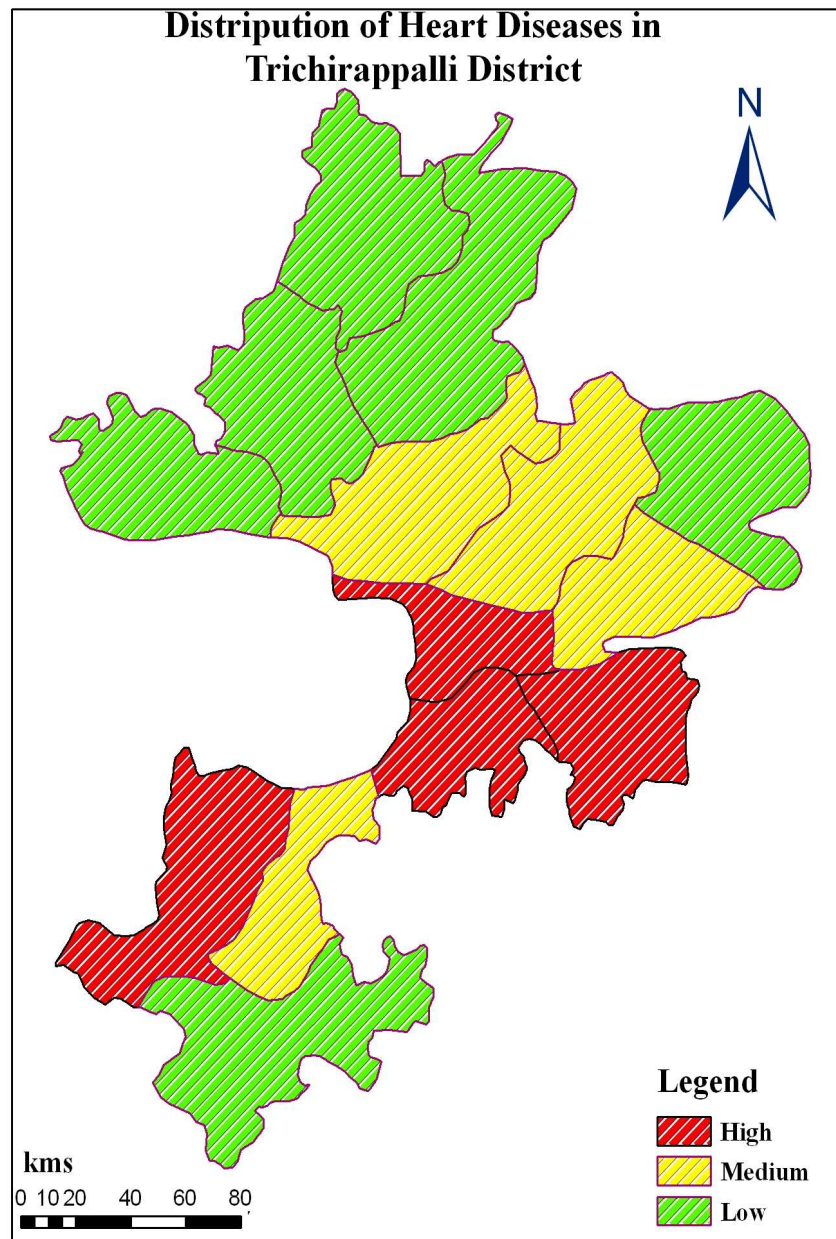


Fig. 5.1 Spatial distribution of heart diseases in Trichirappalli district .

Data analysis and techniques used:

The data were suitably converted into tables drawn from both Primary and secondary Data.. Further the data were grouped into Taluk wise, Sex wise, in order to Map (Disease map of Heart Disease) the purpose of the study. The base Map of Trichirappalli obtained from statistical office.

The Data were suitably converted into measurable simple statistical tables and also attempt to explain with the help of computer graphics. Simple descriptive statistical techniques were extensively employed to analyse the magnitude of the heart diseases. Suitable cartographic tool disease mapping is attempted to explain the spatial distribution of heart disease over space and in time.

RESULTS AND DISCUSSION

The spatial distribution of heart diseases in Trichirappalli district observed for 2004 -2005 data explained that the highest number of cases were in Trichirappalli city region. The high distribution areas are Thiruvembur, Andanallur, Manikandam and Vaiyampattai blocks are largely affected areas in Trichirappalli district. Musiri, Manappari, Manchanellur and Lalgudi blocks are moderate distribution found. The other parts of this district were found low concentration of distribution.

The present study in attempted to analyse the socio economic structure of heart disease with a view to explain the spatial distribution of heart diseases with the help of disease parameters in Trichirappalli district. To analyse the socio-economic structure with help of the suitable graphs to analyse the statistical association between environment and socio-economic parameters.

The graphs attempted heart diseases in Trichirappalli district is divided into four levels.

- 1) Heart diseases in Trichirappalli-Age and sex wise distribution(Fig.5.2)
- 2) Bed occupancy rate for heart diseases. (Fig.5.3)
- 3) Socio-economic status a heart diseases in Trichirappalli district. (Fig.5.4)
- 4) Geographic distribution of Heart Diseases in Trichirappalli District (Fig.5.5)

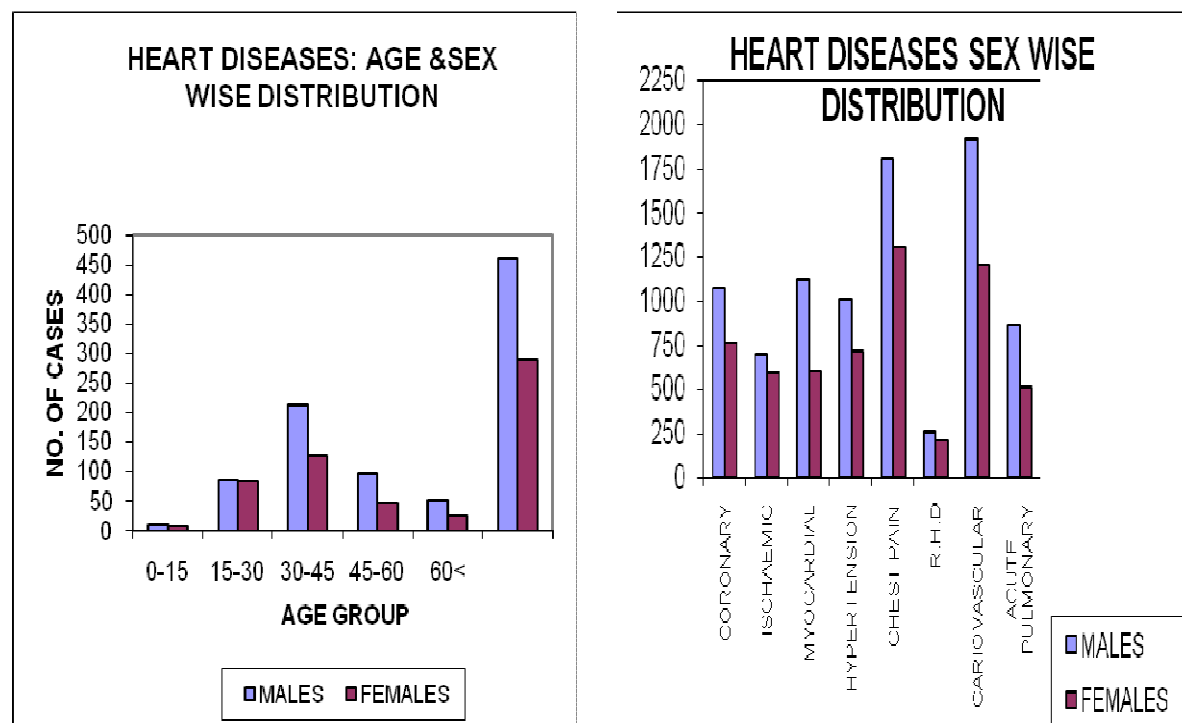


Fig.5.2 Heart diseases in Trichirappalli-Age and sex wise distribution.

Most of the diseases noticed in these areas are associated with the cultural and socio-economic factors which have a major influence on people's life styles. The spatial distribution of the heart diseases in Trichirappalli district revealed that Males are more in number than the females.

Because men are at higher risk of contacting heart diseases than woman. Middle aged men are at high risk with respect to their diet and smoking.

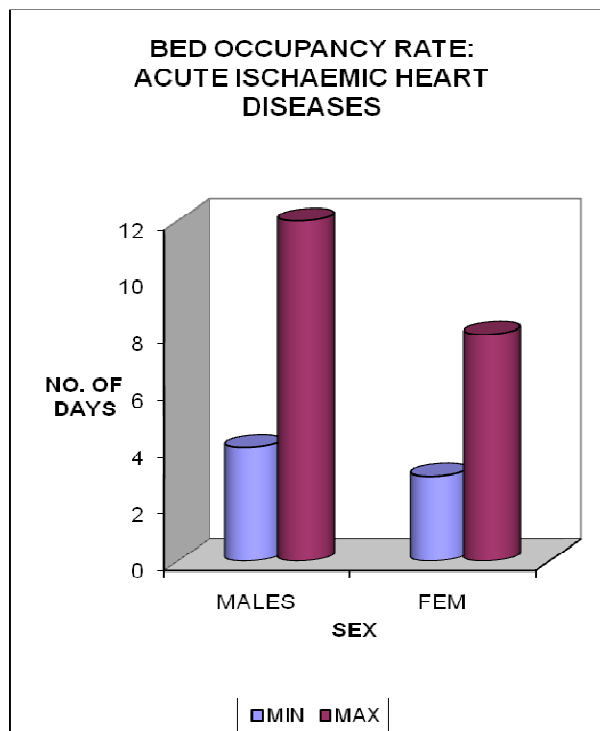
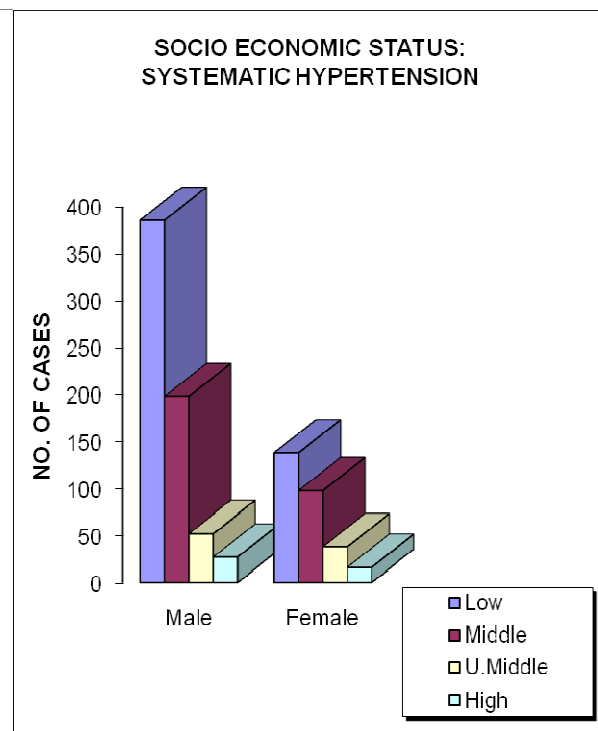


Fig.5.3 Bed occupancy rate for heart diseases



Fig(5.4). Socio-economic status of heart diseases.

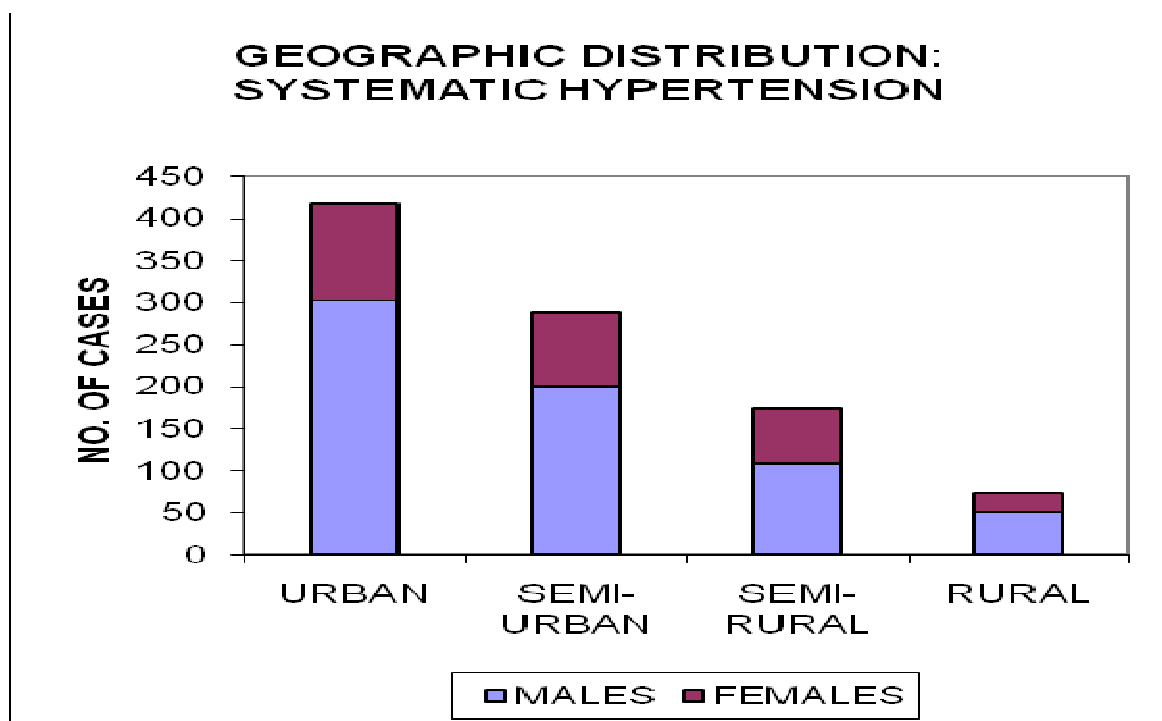


Fig. 5.5 Geographic distribution of Heart Diseases

CONCLUSION

Cardiovascular disease is largely preventable and hence the scientific knowledge is essential to create a world in which heart disease can be prevented. Most of the cardiovascular diseases, is brought about by some combination of smoking high blood pressure, elevated blood cholesterol, unhealthy dietary habits, including excessive alcohol assumption, obesity, sedentary life styles, and psychosocial stress. The problem is increasing everyday due to total mismanagement of the tobacco-free life style individuals. Hence communities must unite with healthy professionals. Developing countries are increasingly being affected by cardiovascular diseases.

In India heart disease is the major public problem. There are various types of heart diseases. Viz., coronary heart diseases, Ischaemic heart diseases, Myocardial infarction hypertension, Rheumatic heart disease etc. In India CHD is reported to have more on the occurrence. The prevalence rate was found to be 65.4 and 47.8 pr 1000 males and females respectively.

In a village like Haryana the prevalence rate was 22.8 and 17.3 per 1000 males and females respectively. The peak period is attained between 51 – 60 years males are affected more than females RHO is a common form of heart disease and the cardiovascular disease is the main cause of death among children and young adults in India. It is estimated that over 6 million children and young adults are affected by this disease. In India Hypertension was noticed among 59.9 and 69.9 per 1000 in males and females respectively in the urban population and 35.5 and 35.9 per 1000 in males and females respectively among the rural population.

Heart disease is one of the major disease in Trichy District which has a very good registration of cases. The present study has justified with the view to analyse the spatial distribution of heart diseases in Trichy District. The Present study has chosen Trichy district and analyzed the spatial distribution of heart diseases in relation to the socio economic determinants life styles, physical activities and environmental conditions.

Recommendations

- 1 The preventive measures sued as the important criteria for the selection a programme discuss the social impact and their potential to improve health and their economic viability.
- 2 Reducing the basic risks smoking ,poor nutrition and lack of physical activity, formulating the implementing health promotion strategies at the community, family and work place levels.
- 3 Ensuring that health insurance conditions and state and community budged provide for life style changes, dietary habits, controlling excessive stress, reducing alcohol consumption , increasing appropriate physical activity and preventing drug the dependence. These alone can help to achieve the goals of cardiac care and also a healthy heart.

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