AN EVALUATION OF PRIMARY HEALTH CARE SYSTEM IN KERALA

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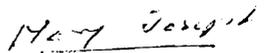Professor
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CERTIFICATE

Certified that the thesis, **"AN EVALUATION OF PRIMARY HEALTH CARE SYSTEM IN KERALA"** is a record of *bona fide* research work carried out by Mrs. Padmaja, K., under my supervision. The thesis is worth submitting for the degree of doctor of philosophy.

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DECLARATION

I declare that the thesis **"AN EVALUATION OF PRIMARY HEALTH CARE SYSTEM IN KERALA"** is the record of bona fide research work carried out by me under the supervision of Dr. Mary Joseph, T., Professor, School of Management Studies, Cochin University of Science and Technology, Cochin – 22. I further declare that this thesis has not previously formed the basis for the award of any degree, diploma, associateship, fellowship or other similar title of recognition.

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CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1

INTRODUCTION, METHODOLOGY AND DESIGN OF THE STUDY

1.1. Introduction

1.1.1. Significance of health

"Health is not everything in life. But life is nothing without health."

(Peter Sweifel)[1]

Health of the people is really the foundation upon which all their happiness and all their power as a state depend. Health is a component of what is known as welfare and it is man's most precious possession. Good health and long life have therefore traditionally been the most prized goals of mankind. Good health is considered as a pre-requisite for economic development and social welfare. A healthy community is the infrastructure upon which an economically viable society can be built up as unhealthy people can hardly be expected to make any valid contribution. Thus, health is considered as highly valued asset. It is even claimed that health is the only thing that counts in life.

This was recognized by our sages. Charaka, the renowned Ayurvedic physician who lived 2500 years ago, had said that health is critical for the realization of the four fold aims of life- the ethical, artistic, materialistic and spiritual. "Dharmarhta kama moksham, Arogyam moolamuthamam" (Parthasarathy, 1992)[2].

Buddha, the enlightened one, had propounded the noble percept, Arogyam Parama Labha (Of all gains, the gains of health are the highest and the best) (Goel, 1984).[3] The constitution of the World Health Organization had stated that "Enjoyment of the highest standard of health is one of the fundamental rights of every human being without any distinction of race, religion, political belief, economic and social condition".[4]

Sreenivasan (1984)[5] regarded health as one of the fundamental rights of the people and a universally cherished goal. Goel (1984)[6] in his work on public health administration gave priority to promotion of health for national progress. According to him nothing could be of greater significance than the health of the people in terms of resources for socio- economic development. Dodzie (1979),[7] United Nations Director General for Development and International Economic Co-operation in his article has rightly said that "promotion and protection of the health of the people is essential to sustained economic and social development and contributes to a better quality of life and to world peace".

Thierry (1969)[8] in his article, "Laying foundation", succinctly remarked that "Health is man's precious possession: it influences all his activities, it shapes the destinies of the people. Without it, there can be no solid foundation for man's happiness". Thus, it is clear that there can be no two opinions that health is basic to national progress and in terms of resources for economic development nothing could be of greater significance than the health of the people. Good health must be a primary objective of national development programmes. It is a precursor to improving the quality of life for a major portion of mankind.

The National Planning Committee in the Interim Report of its sub committee on Health, highlighted the need to have a state controlled free health system. Health of the people was seen as the responsibility of the State[9].

Jean Dreeze and Amarthya Sen (1996) viewed health from two aspects- "health is wealth and also health creates wealth. The maxim that health is wealth highlights the increasing importance of health. Health is valued on its own; it is perhaps the supreme element of economic development"[10]. Now, health has been accepted as a universal social goal. Since 1960s the social development movement, and from the beginning of 1990s, Human development Report of United Nations Development Programs (Darshsni Mahadeva, 2000) have emphasized improvement in the health status of population as one of the important goals of development[11]. Thus it is increasingly being recognized that good health is an important contributor to productivity and economic growth, but it is first and foremost, an end in itself. In a country like India, where the only asset most people have is their bodies, health assumes even greater significance.

Public health programs thus play a very significant role in the physical .and mental well being of every nation. It consists of a wide spectrum of services such as primary health care including provision of preventive and curative services, health education, protection of mother and children, family welfare, and control of environmental hazards and communicable diseases. The provision of these services will improve the physical and mental development of the human beings.

1.1.2. Primary Health Care: Changing Concepts. (Conceptual Frame Work)

One of the great difficulties in delivering health care to the common man in the developing countries is that it does not percolate into the grass root levels in the villages. With political independence, there was a national commitment to improve health in developing countries. Against this background different approaches to providing health care came into existence. They are:

1. Comprehensive health care: The term 'comprehensive health care' was first used by the Bhore committee in 1946. By comprehensive services, the Bhore Committee meant provision of integrated preventive, curative and promotive health services from "womb to tomb" to every individual residing in a defined geographic area. The Bhore Committee suggested that comprehensive health care should replace the policy of providing more medical care. This concept formed the basis of national health planning in India and led to the establishment of a net work of primary health centers and sub centers.

2. Basic health services: In 1965, the term "basic health services" was used by UNICEF / WHO in their joint health policy. Basic health services is understood to be a net work of coordinated, peripheral and intermediate health units capable of performing effectively a selected group of functions essential to the health of an area and assuring the availability of competent professional and auxiliary personnel to perform these functions.

3. Primary healthcare: A new approach to healthcare came into existence in 1978, following an international conference at Alma-Ata (USSR). This is known as "primary health care". It has all the hallmarks of primary health care delivery, first proposed by the Bhore Committee in 1946 and espoused worldwide by international agencies and national governments.

Before Alma-Ata, primary health care was regarded as synonymous with "basic health services" "easily accessible care", "Services provided by generalists" etc. The Alma-Ata international conference gave primary healthcare a wider meaning. The Alma-Ata Conference defined primary healthcare as "essential health care made universally accessible to individuals and acceptable to them, through their full participation and at a cost the community could afford"

1.1.3. Background

In   the early 1950s, many developing countries were concentrating their efforts on the eradication of diseases through mass campaign run outside the main structure of their health services. As early as 1953, WHO was stressing the need to strengthen basic health services to meet the urgent problems affecting large sections of the population. During the 1960s, a number of developing countries integrated their special programs with their basic health services. Progress in developing basic health services – particularly in rural health services – had been slow and uneven. A joint UNICEF/ WHO study reported in 1975 that despite great efforts, the basic needs of vast number of people through out the world were still unmet. Too often the pattern of health services has been modeled on those in industrialized countries- relatively sophisticated services

staffed by highly qualified personnel. These services, which have been concentrated in cities and towns, have been predominantly curative and have catered to only a small minority of the population. In other words, many stopped to believing in an instantaneous trickle down effect of economic growth. It has not proved possible to expand effective access to services of this type to anything like the entire population. Several world health assemblies have stressed that an alternative approach can be practicable and relatively successful if,

1. Promotion of their own health and welfare is an essential ingredient of primary health care.
2. Intersectoral coordination. The emphasis is switched from urban to rural population and to the under privileged.
3. Services are integrated, combining both curative and preventive strategies as part of wider socio economic development.
4. The importance for the health of sanitation, housing, nutrition, education and communication is given full recognition.
5. The use of services is promoted where local population takes a major responsibility for them both in providing manpower facilities and in participating in decision on local health policies.
6. Locally restricted primary health care workers, supported by their communities, can form the front line of the health care system.
7. The work of indigenous healers is given full recognition.

In 1977, the World Health Assembly decided that the main social target of government and WHO should be "the attainment by all the citizens of the world by the year 2000 of a level of health that will permit them to lead a

socially and economically productive life". The concept of primary health care came into lime light in 1978 following an international conference in Alma -Ata USSR which declared that primary health care was the key to attaining health for all.

The primary health care approach is based on principles of social equity, nation wide coverage, self- reliance inter sectoral co-ordination, and people's involvement in the planning and implementation of health programs in pursuit of common health goals. This approach has been described as "Health by the people" and placing people's health in people's hand. Primary health care was accepted by the member countries of WHO as the key to attaining the goal of health for all by the year 2000 A D.As stated in the reports of the Alma-Ata International Conference on primary health care, the following eight elements are considered essential.

1. Promotion of proper nutrition and an adequate supply of safe water
2. Basic sanitation
3. Maternal and child health care including family planning
4. Immunization against the major infectious diseases
5 Prevention and control of locally endemic diseases
6 Education concerning prevailing health problems
7 Appropriate treatment of common diseases and injuries.
8 Provision of essential drugs

In 1979, the World Health Assembly invited the member states of WHO to formulate national, regional and global strategies, a health strategy having been described by the WHO Executive Board as "the broad lines of action

required in all sectors to give effect to health policy. The global strategy published in 1981, started from country strategies and was built up through regions to the world level. It is a synthesis of ideas derived from national and regional strategies. The main thrust of the strategy is

1. Primary health care to deliver programmes that reach the whole population.

2. Action to be taken by individuals, families and communities as well as by health services and health related services in other sectors

3. Technology that is appropriate, scientifically sound, adaptable, acceptable, to users, and with in the capacity of the country to afford.

4. Higher degree of community involvement.

5. International action to support national action.

1.1.4. Significance of Primary Health Care

The emphasis on primary health care originated from five underlying ideas. The first was recognition of the importance of inter – sectoral action for health development. This grew out of the discussion of development from the middle 1960s, which recognized that economic growth did not necessarily ' trickle down ' to the poor as economists had too readily assumed, and that the central problem of development was how to meet the basic needs of poor. Economic and social developments were not separate but closely inter related. The second reason was the recognition based on experience of earlier programmes, that the key infectious diseases could not be successfully combated by specific isolated programmes of mass campaign against particular diseases controlled from the center. All health programmes needed the support of local

health staff and local population. The third underlying idea was that preventive and promotive action should not be separated from curative action. This was the way in which services had developed in most countries, both developed and developing. Fourth was the evidence that there was a range of health activities, which were relatively cheap and very effective which nevertheless, did not reach millions of people through out the world. Finally, it represented a strong action against authoritarian attempt of the health professionals to impose health on people

1.1.5. Some denials

Reviewing what it is not intended to can further strengthen an understanding of primary health care. First, it is not a vertical programme aimed at eradicating a disease or having a separate organizational structure. Its success will depend on the delivery of its vital component and integration within and beyond the health care system. Second, it is not primitive health care. Although it is antonymous with 'rich' sophisticated 'medical care', it is basic health care for both the rich and poor. Its preventive and promotive tasks are applicable equally to all sections of the population. Third, primary health care is not a paramedical programme to be run by unskilled people. Medical profession has an important role to play in the organization and delivery of primary health services. Fourth, while primary health care may be 'low cost' relative to the price of sophisticated medicine, it is not intended to be cheap health care for the poor. Provision of universal health services will require sizeable financial allocations. Its implementation will most likely require increased budget for the health sector.

1.1.6. Characteristics

Primary health care is both a 'philosophy' and a 'strategy' (Cole-King, 1981)[12]. Its philosophical merit is derived from the principles it espouses, while its strategy consists of broad based activities with in and beyond the health sector aimed at the improvement of health. The philosophy of primary health care holds that health is a basic human right. Thus, the main objective of a policy espousing primary health care would be to provide as yet un-reached groups with at least basic health services through redistribution of financial resources, man power and materials.

1.1.7. Principles of Primary Health Care

1. Universality: Primary health care is a flexible approach. It is applicable to all nations irrespective of their problems, resources and state of development or requirements. It should be available for all irrespective of sex, age, religion, status or ability to pay.

2. Accessibility: Sufficient proximity is another consideration. Many, especially the vulnerable segments such as women, children aged, rural and urban poor and tribal do not have access due to remoteness or inability to pay. It is a well-known injustice that though 3/4th of the world's population live in rural areas and usually contribute as much of the countries income, the urban elite, who generally form only 1/4th of the population, have 3/4th of health services. By equitable distribution we can make it more accessible for all.

3. Acceptability. This implies social and cultural acceptance. The wide social distance between the sophisticated health providers and poor,

illiterate villagers and tribal is an inhibiting factor affecting both accessibility and acceptability.

4. Community participation: Not with standing the overall responsibility of Central and State governments, the involvement of individuals, families, and communities is an essential ingredient of primary health care. There is an increasing realization of the fact that the components of primary health care cannot be provided by the health sector alone. The declaration of Alma-Ata states that "primary health care involves in addition to the health sector, all related sectors and aspects of national and community development, in particular agriculture, animal husbandry, food, industry, education, housing, public works, communication and other works"(WHO, 1978)[13].

5. Appropriate technology: Appropriate technology has been defined as "technology that is scientifically sound, adaptable to local needs, and acceptable to those who apply it and those for whom it is used, and that can be maintained by the people themselves in keeping with the principle of self reliance with the resources the community and the country can afford" (WHO, 1978)[14].

1.2. Statement of the problem

Kerala has been described as a unique case among developing countries, a society where the health and demographic transition have been achieved within a single generation, i.e. after the formation of Kerala. Kerala has apparently entered the third or final phase of demographic transition characterized by low birth rate and declining death rate leading to a slow down in the growth rate of population. Birth rate in Kerala is reduced to 16.2 9as

against 25.4 for all India in 2004. Infant mortality rate is 10.0 as against the All India rate of 63.0 for the same period. The crude death rate for Kerala in 2004 was 6.4 per 1000 compared to national average of 8.10 and an average of 10 for low-income countries and 8 for middle-income countries. Kerala infact has achieved the basic development indicators in 1980, which the Government of India has targeted for 2020[15.]

Most analysts have seen Kerala's achievements in health as something of an enigma. Kerala achieved the health status as par with that of USA spending roughly 10 US $ per capita while US spends about 3500 $ per capita per year on health care. Kerala's achievement in health in spite of its economic backwardness and very low health spending has prompted many analysts to talk about "Kerala Model of Health", worth emulating by other developing parts of the world (Anita, 1996).[16]

Apart from the socio economic factors, the universally available public health system in Kerala has also contributed much to the high health status of the people. Various studies tend to concentrate on the success of public health programmes in controlling infectious diseases and on greater accessibility to and the utilization of medical care system in Kerala. Kabir and Krishnan (1992)[17] have pointed out the critical role played by the government in providing access to health and the importance of social and political change in bringing about the health transformation in Kerala. Another major indirect finding was the importance of preventive and public health measures in reducing morbidity and mortality. According to Kannan *et al.* (1987)[18], Public health care institutions have played a crucial role in health care in the early decades but since eighties there has been rapid expansion in the health car facilities in the private sector.

Low rate of utilization of public health care even among the poor shows poor performance of the public health institutions and the preventive health care aspects in the public institutions does not seem to get the attention they warrant. Paniker (1975)[19] attributed the health improvement in Kerala mainly to the development of public health measures. A United Nations study (1975)[20] on Kerala's health development concluded that development of Kerala in lowering mortality rate and rising life expectancy to almost to the levels of more developed countries must be attributed largely to the widespread net work of health services and their utilisation. Public health measures such as sanitation, control of infectious diseases introduced by Travancore and Cochin in the 19th and 20th centuries were the key to reduce mortality. Nair (1974)[21] suggested that the extension of primary health centers and public health measures in the state has led to the decline in IMR and mortality in 1950s and 1960s. Paniker and Soman (1984)[22] laid equal emphasis on public health and medical care services. While the first phase of health status improvement was attributed to preventive health measures against infectious diseases, in the second phase the stress was on the expansion of medical care. This was also supported by KSSP study (Kannan *et al.*, 1991) [23]. Thus major studies pointed out the critical role played by the public health measures in attaining signal achievements in health in Kerala. Universally available public health system in Kerala has contributed to the high health status of the people in Kerala.

Present disturbing trend is that pubic health system is getting alienated from the people since 1980s, and only 30 % of the people even from the lower income seek medical help from the government hospitals. This is because of the fall in the quality of the services of the government hospitals. Today, rate of utilization of private sector has increased drastically pointing to the poor

performance of the public health sector. Higher and increasing trend of utilization of private sector even by the poor is a strong indicator of several shortcomings of public health care institutions. According to Paniker (1992)[24], private expenditure in Kerala is one of the highest in India. Lack of political commitment, bureaucratic inefficiency, corruption at various levels, lack of proper planning etc has contributed to this sorry state of affairs. Thus, the importance of public sector in health service in the state has waned greatly.

A comparison of the infrastructure and health manpower development in the private and public sector confirms the supremacy of the private sector in the state. The number of beds in the government institutions grew from around 36000 to 38000 in the 10year period from 1986 to 1996, where as in the same period, beds in private institutions grew from 49000 to 67500 (Kunnikannan and Aravindan, 2001)[25]. This amounts to nearly 40% growth in the private sector beds in a period of 10 years as against nearly 5.5% in the government sector. In the case of doctors about 5000 doctors work in the government sector where as double the number work in the private sector. More significantly the private sector has far outpaced the government facilities in the provision of sophisticated modalities of diagnosis and therapy, such as CT scan, MRI scan units etc. Simultaneously, public health itself is being subjected to internal privatization. Because of the irregular supply of medicines and other materials patients seeking medical care from the government hospitals are forced to buy them from outside.

The changing health scenario of Kerala has provoked analysts to comment that the Kerala Model of Health care is slowly drifting towards an American model of Health care. The hallmark of development experience of

14

Kerala was low cost of health care and the universal accessibility and availability even to the poorer sections of society. This may be changing to a situation where in spite of the technological supremacy 40 million are denied health care because of privatization and the escalation of health care cost (Aravindan, 2000)[26]

Various studies on rural primary health care have observed that, though the infrastructure is in place in most areas, they are grossly under utilized because of poor facility, inadequate supplies, and lack of proper monitoring and evaluatory mechanism. Without safe and effective front-line care, secondary and tertiary care is likely to be inefficient and perhaps ineffective. Bypassing of peripheral facilities is one of the inevitable consequences of low quality. Relatively little work has been done on the evaluation of pubic health programmes in general and primary health care in particular. Even less has been done to assess the quality of primary health care. Against this background, the present study attempts to analyze the performance evaluation of primary health care system in Kerala. Hence the basic research questions are: How does the different element of primary health care work in Kerala? Whether any particular area of primary health care needs special attention? Is there any deterioration in the quality of performance of primary health centers, which are the nuclei of providing primary healthcare to the rural poor?

1.3. Objectives

1. To examine the working of the primary health care system in Kerala
2. To assess the impact of the working of primary health care system on the health status of the rural population.

3. To analyze the operational efficiency of the primary health centers in providing primary health care to the rural people.

4. Finally, to find out the point of weakness in the working of primary health care in the study area and to suggest remedial measures.

1.4. Hypothesis

1. Changes in the health profile require reallocation of resources of primary health care system.

2. Rate of utilization depends on the quality of services provided by primary health centers

3. There is a significant decline in the operational efficiency of the primary health care system

1.5. Methodology

The major elements of primary health care stated in the report of Alma-Ata International Conference on Primary Health Care (WHO, 1994)[27] is studied on the basis of the classification of the elements in to three: Preventive, Promotive, and Curative measures. Preventive measures include Maternal and Child Health Care including family Planning. Provision of water and sanitation is reviewed under promotive measures. Curative measures are studied using the disease profile of the study area. Health indicators given by WHO in the World Health Annual Statistics[28] for proper evaluation and comparison of primary health care among countries are used to evaluate the outcome, and to know the impact of the working of the primary health care system on the health status of the people. Finally, performance evaluation of the primary health centers is done

through the opinion survey collected from the people relating to their awareness, accessibility, acceptability, and availability of the primary health care facilities.

1.5.1. Data Sources

The study is based on both primary and secondary data. Secondary sources of data include published and unpublished data related to preventive, promotive, curative measures and out come indicators. Many of the government offices such as Directorate of Health Service Trivandrum, Economics and Statistics Department Trivandrum, District Medical Offices of the sample area, Primary Health Centers and Hospitals served as sources of information in this regard.

Collection of primary data was done through a sample survey, using pre-tested interview schedule of households of the study area.

1.5.2. Sampling Technique

Multi stage random sampling design was used for selecting the sample. In the first stage, the Districts were divided into two strata on the basis of indicators such as per capita income, literacy rate, bed population ratio (Private and Government), number of hospitals per square kilometer. The Districts were ranked on the basis of these indicators and an average index was computed for each District. The Districts were then grouped into two on the basis of their index: 1. having an index value of seven and less than seven 2. with an index value greater than seven. One District was selected at random from each of the strata. Thus, Trichur District was selected from the first

group and Palakkad was selected from the second group. In the second stage, one block was selected at random from each of the two Districts. Thus, Kodungallur and Chittur block were selected from Trichur and Palakkad respectively. In the next stage, three Panchayats were selected at random from each of these blocks. In the final stage, fifty households were selected at random from each of these Panchayats. Thus, making a total sample size of 300 households. The sample unit was defined as a household where there was a birth one year prior to the survey and belonged to the lower or middle-income groups.

1.5.3. Household Characteristics

The households surveyed have been classified into three groups using socio- economic variables. The characteristics included here are (1). Per capita income (2). Educational status (3) Land ownership and (4). Housing conditions. Initially, ranks are assigned to each household according to their characteristics and then weights are assigned to their individual ranks so as to have socio economic status classification. Thus, three classes viz: SES 1, SES 2 and SES 3 are formed as is explained below.

SES Characteristics

Per capita income

Per capita income was considered most important for health status since payments will have to be incurred in the event of treatment. The figure relating to income are those reported by the heads of the households. Per capita income was worked out and the households were ranked as follows.

1. If the per capita income was < 250 per month

2. If the per capita income was >250 <500

3. If the per capita income was >500)[1]

Cut off rate of poverty here is estimated as Rs 250. Those who are located below this level are considered as poor. As per the survey result, 62 % of the households in Kodungallur and 68 % in Chittur come under this category. IRDP survey of 1992 recorded poverty level of 39 % in Kodungallur and planning commission estimated it as 10 %. To have a clear classification, another characteristic included was and ownership.

Land ownership

Total land owned by the household was taken into account and accordingly the households were divided into three groups. This is used as a counter check for income. The criteria used for classification of house holds according to the land ownership is

1. If the land owned is < 11 cents

2. If the land owned is 11 to 25 cents

3. If the land owned is > 25 cent

The first group is generally the land less or land poor, most of them having a few cents of homestead lands. Under the Kerala government scheme of redistribution of land to the land less, 10 cents was upper limit. The second group would be marginal farmers who may not be able to derive any substantial

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[1] As per the planning commission's estimates, cut off points of poverty is worked out as Rs 228 and 264 for rural and urban areas respectively at 1992-93 prices. For a household of five members, the poverty line has been fixed at an annual income of Rs 13680 in rural areas and Rs 15840 in urban areas

income from the land. The third group consists of small farmers. The land distribution brings out that 50% comes under the first category, 27% in the second category and 23% in the third category in Kodungallur block and the same for Chittur block is 11%, 81% and 8 % respectively.

Educational Attainments

Health and education are closely related. Literacy, especially female literacy plays an important role in health attainments. Because of the existence of high degree of correlation between health and education, the third characteristic included for classification is educational attainments among sample households. Kerala stands at the top of the list of human development indicators with a literacy rate of over 90%. Because of this special condition with regard to educational attainments no household was seen where all members are illiterate in Kodungallur and Chittur Block. Therefore, the criterion adopted for ranking was:

1. If the household had at least one member having seven years of schooling, but no one having high school or above high school level education
2. If the household had at least one member having high school level education but none with above high school level education.
3. If the household had more than one member with high school level education and or at least one member with above high school level education.

As per the educational classification, in Kodungallur Block, 6% comes under the first category, 47% in the second category and 43% in the third category. As against this, in Chittur block, 7% of the households were grouped under the first one, 67% in the second and 26% in the third one.

Housing condition

Fourth character included for classification is the nature of housing condition. The housing conditions to some extent would reflect the physical amenities. Two elements of housing conditions were considered here. One was roof of the house and the other was floor of the house. The details of grouping under these two characteristics are given below.

1. If the roof was made of grass, thatch etc

2. If the roof was made of tiles

3. If the roof was made of concrete

As far as the floor is concerned

1 If the floor is made of mud

2 If the floor is made of cement

3 If the floor is made of mosaic, marbles etc.

With respect to the classification according to the condition of roof a little less than $1/3^{rd}$ came in the third in Kodungallur where as in Chittur block it was a little over $1/10^{th}$. Majority of the households belonged to the second group in both divisions though Chittur Block had higher proportion than Kodungallur. It was surprising to see that only 1% came under the third category in Chittur division in terms of classification according to floor, though a little more than

1/10th comes under this category in Kodungallur division. Again, more than 1/3rd of the sample units in Chittur belonged to the first group where as it is only less than 1/10th in Kodungallur. Seventy seven percentage of the households in Kodungallur and 67% in Chittur belonged to the second group. Distribution of households according to the above characteristics is summarized below in Table 1.1.

Table 1.1.

Distribution of Households by Socio Economic Characteristics

Rank	Monthly Per capita		Land Owned		Education		Housing Condition			
							Roof		Floor	
	Kodu	Chittu	Kodu	Chittu	Kodu	Chittu	Kodu	Chittu	Kodu	Chittu
1	93 (62)	102 (68)	75 (50)	16 (11)	9 (6)	10 (7)	22 (15)	28 (19)	13 (9)	48 (32)
2	34 (23)	28 (19)	41 (27)	122 (81)	71 (47)	100 (67)	88 (59)	104 (69)	116 (77)	100 (67)
3	23 (15)	20 (13)	34 (23)	12 (8)	70 (47)	40 (26)	40 (26)	18 (12)	21 (14)	2 (1)
Total	150 (100)	150 (100)	150 (100)	150 (100)	150 (100)	150 (100)	150 (100)	150 (100)	150 (100)	150 (100)

Source: Survey data.
Figures in the parentheses are percentages

Assigning some weights to the ranks (Kannan *et al.* 1991)[28] obtained to the individual households forms socio-economic classification. The weights assigned were 0.35 for income, 0.25 for education, 0.25 for housing (0.10 for roof and 0.15 for flooring) and 0.15 for land possessed. Thus, three groups of classes were obtained as SES1, SES 2 and SES 3.

Here SES 1 represented lower income strata, SES 2 represented middle-income strata and SES 3 represented higher income strata. Middle-income group in this study represented income which was just sufficient to meet the subsistence level and higher income groups were those whose income was just above the subsistence level since sample units are mainly lower and middle income groups. Thus, SES 1 = Lower strata, SES 2 = middle strata and SES 3 = higher strata. Socio economic classes of sample households of the two areas were obtained as shown in the Table 1.2. From the table, it was seen that in Kodungallur division a little less than half of the samples belonged to the second group and $1/3^{rd}$ came under the third group. As against this, in Chittur division, only 14% belonged to the third and nearly half belonged to the second. Thirty five percentage of the households in Chittur were in the first category where as it is only 23 % in Kodungallur division.

Table 1.2.

Socio Economic Classification of Households

Status	Number		Percentage	
Group	Kodungallur	Chittur	Kodungallur	Chittur
SES 1	34	52	23	35
SES 2	71	76	47	51
SES 3	45	22	30	14
Total	150	150	100	100

Source: Survey data

1.6. Theoretical Framework

Donabedian (1980)[29] has identified three broad dimensions of health care provision that can provide a focus for evaluation, namely, structure, outcome and process. The first of these refers to the physical environment of care, taking into account the nature, amount and distribution of buildings, equipment and personnel. The availability and quality of physical and human resources are studied under structure evaluation. Outcome evaluation is centered on the end results of care with the prime objective being to measure the impact of health care services. An outcome is defined as any change in the health status of a patient that can be directly attributed to the treatment or care they have received. Finally, evaluation of process involves a consideration of what actually goes on between health service professionals and patients during the course of the delivery of health care.

Farmer (1993)[30] used the structure, process and outcome criteria to study the care and treatment provided by the primary health care team for patients with risk factors for cardio-vascular disease. Maxwell (1992)[31] provided a quality assessment framework for health care systems, which incorporates Donabedian's structure, process-outcome model. Roemer and Montoya-Aguilar (1988)[32] illustrated the structure, process outcome model to assess the quality of primary health care .The distinction between structure, process and outcome had been illustrated with examples to clarify the meaning of the widely used model concerning structure, process and outcome, when applied to health experience in a population.

An audit of structure is primarily designed to describe the quality of the physical surroundings in which health care is delivered and assess the general structural aspects of care. It can include reference to the provision and layout of treatment of rooms, the age and condition of specialists, medical equipments, level of staff training, the organization of medical teams and the ratio of staff to patients. These structural characteristics are important and have some bearing on quality, particularly insofar as there are likely to be more opportunities for promoting and improving the quality of care if the appropriate medical equipment, diagnostic services and treatment facilities are readily available to health professionals. However, structural evaluation does not contain any reference to the actual performance of those involved in the delivery of care. This is covered by process and out come evaluation.

Process evaluation concentrates on what health care workers actually do for their patients. It involves all that is done to and for patients; it covers the technical, clinical and humanistic aspects of prevention, diagnosis, treatment and rehabilitation. An outcome evaluation looks at the results of interventions such as whether there is an improvement or deterioration in the health of the patient. In other words, outcomes describe the impact and effectiveness of treatment or services. Donabedian (1988)[33] defined outcome in a broader term as the changes in a patient's current and future status that can be attributed to any health care. Thus, outcomes of care include not only measures of mortality, morbidity and general physical well-being, but also changes in the level of social well-being of the beneficiaries.

1.6.1. Measuring Outcomes: Health Status and Quality of Life

A critical step in the successful evaluation of health care initiatives is the identification of appropriate outcome measures or indicators of health status. Mortality and morbidity indices are among the most easily available objective measures used in health studies. Prior (1985)[34] noted that the information obtained from death certificates, which is used to compile official mortality statistics, is not of a consistent quality. Haynes (1988)[35] also draws attention to some of the methodological issues surrounding the definition and measurement of mortality and morbidity.

In certain clinical circumstances, survival may be an appropriate way of assessing the value of a treatment. By means of clinical trials, the effects of medical or surgical interventions can be evaluated by comparing the case fatality rates over a five-year survival period. However, it does not always follow that death and survival represent the best way of determining success and failure even when dealing with the treatment of chronic illness (Ebrahim, 1990)[36].

1.6.2. Performance Evaluation: the Quality of Health Care

As a result of the National Health Service reforms in the 1980s and 1990s the evaluation of the quality health care became 'a mandatory part of service provision' (Ellis and Wittington, 1993)[37]. Patient satisfaction surveys or surveys of beneficiaries were adopted as one of the main methods of data collection in the process of quality performance evaluation.

1.6.3. Beneficiary Satisfaction Surveys

Studies of surveys of beneficiaries with the medical and nursing services they receive form an important component of health care evaluation research. Although the patient's distinctive viewpoint is now widely recognized to be a vital element in the evaluation of health services, there is still no consensus about optimal ways of capturing this perspective (Fitzpatrick, 1997)[38]. There are many examples of local and national studies of patient attitudes towards various forms of health care.

Self-completion questionnaires are the primary method of data collection in patient evaluation research. The simplest questionnaires ask respondents to give 'yes-no' answers to questions about aspects of their contact with the health care services. From the responses it is possible to calculate what percentage of respondents is satisfied or dissatisfied with a particular treatment or service rendered to them by the authorities.

1.7. Method of data analysis

The design of the present study is both descriptive and analytical in nature .As far as the analytical tools are concerned ,growth index, percentages, ratios, rates, time series analysis, analysis of variance, chi square test, Z test were used for analyzing the data.

1.8. Need and Relevance

Primary health care system forms an integral part of a community's health system. It is the central function and main focus of the overall socio-

economic development of the community. Without having a strong and effective primary health care system secondary and tertiary sector will not work. Evaluation process will improve the out come or effectiveness of the programme. It will show not only the accomplishment of a programme, but it may also suggest the points of difficulty or weak links and over all programme may yield improvements.

1.9. Scope and limitations

The present study could shed light on the need for prioritization of resources in the light of sub-optimal allocational pattern of the primary healthcare components. An economic evaluation of these components of primary healthcare system will throw light into the optimum resource allocation pattern which may increase the operational efficiency of the existing system.

1.10. Scheme of study

The present study is organized under nine chapters viz.:
1. Introduction, methodology and design of the study
2. Literature review
3. An over view of working of primary health care system in India and Kerala.
4. Health scenario of Kerala
5. Morbidity transition in rura°
6. Evaluation of preventiv(· ·   ⌐asures
7. Evaluation of curativ(

8. Performance evaluation of primary healthcare system from the beneficiary point of view.

9. Summary of findings.

The subject matter of the first chapter is the statement of the problems, objectives, scope and limitations of the study, hypothesis, method of data collection and analysis.

Review of literature is presented in the second chapter which includes changing concept of health, nature, meaning and effectiveness of primary health care socio-economic development and health status, problems and policy perspectives.

Chapter three gives an over view of major health planning and the working of primary health care system in India and Kerala with special focus on preventive and promotive measures.

Chapter four provides a picture the health scenario of Kerala using the health indicators like birth rate, death rate, infant mortality rate, life expectancy at birth and health expenditure. An attempt was also made in this regard to have a national and international comparison so as to know the status of health development in Kerala.

Since mortality syndrome is a major problem pointed out by major studies chapter five is directed to give a detailed picture related to morbidity transition in Kerala. Here, morbidity data since early nineties given by various studies has been presented to have morbidity picture.

Analysis of data is presented in sixth, seventh and eighth chapters. Analysis of preventive measures, promotive measures, and its impacts are discussed in the sixth chapter. Disease profile of the study area using data from District Medical Office, Primary Health Centers, and Private Health Centers and primary data collected were analysed in the seventh chapter. Eighth chapter deals with evaluation of performance of primary health care system from the beneficiary point of view. This is used to get a picture related to operational efficiency using quality measurement of primary health centers.

Chapter nine concludes the reports with summary of findings and recommendations.

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CHAPTER 2

LITERATURE REVIEW

This chapter presents a review of available literature pertaining to health and health related issues. The first section reviews meaning and changing concepts of health enunciated by different authors. The second section is followed by the review on the nature, meaning and effectiveness of primary health care. Third section reviews socio economic development and health status which will provide a brief description on the impact of various factors on health status. Finally, various problems and policy issues are reviewed so as to have a clear understanding on the various issues.

2.1. Changing Concept of Health

Health is one of those terms which most people find it difficult to define although they are confident of its meaning. Health is a common theme in most culture. Infact all communities have their concept of health as part of their culture (Park, 2002)[1]. Health is viewed differently by different people all over the world (Goel, 1984)[2]. Not only are there marked differences in lay man's definition of health, but their perceptions do not always match with those held by health professionals. Consequently, there is much controversy surrounding the conceptualization and measurement of health (Alan Clarke, 1999)[3].

The concept of health is going beyond illness –its prevention and cure. Over the centuries, it has evolved as a concept from an individual concern to a

world wide social goal and encompasses the whole quality of life. A brief review on the meaning and changing concept of health is given below.

The most widely accepted definition of health is that given by the WHO (1978)[4] in the preamble to its constitution which is as follows: "Health is a state of complete physical, mental and social well being and not merely an absence of disease or infirmity". Although this is an attractive definition, it is subjective and hard to assess (Deon Filmer, *et al*. 2000)[5].

As stated in the first five year plan (1951)[6], "Health is a positive state of well being in which harmonious development of mental and physical capacities of the individuals lead to the enjoyment of a rich and full life. It implies adjustment of the, individuals to his total environment. WHO (1957)[7] defined health as a condition or quality of the human organism expressing the adequate functioning of the organism in a given condition, genital and environmental. Seal (1963)[8] in his presidential address defined health as: "flexible state of body and mind which may be described in terms of a range with in which a person may sway from the condition where in he is at the peak of enjoyment of physical mental and emotional experiences having regard to environment, age, sex, and other biological characteristics due to the operation of internal or external stimuli and can regain that position without outside aid".

Dubos (1965)[9] defined health saying: "Health implies the relative absence of pain and discomfort and a continuous adaptation and adjustment to the environment to ensure optimal function". This is known as ecological concept of health. Holistic concepts corresponds to the view held by the ancients that health implies a sound mind in a sound body in a sound family in sound environment

(WHO 1978)[10]. According to Berthet (1979)[11], Secretary General of the International Union for Education, Paris, health should not be defined in terms of sickness, but rather in relation to the harmonious development of every individual's personality. It represents a balanced measure of a person's total potential, biological, psychological and social; and to the notion of individual's health we should add the concept of family and community health. Ahmed and Coelho (1979)[12] based on bio-medical concept viewed health as 'absence of disease' and if one was free from disease, then the person was considered healthy. Goel (1984)[13] stated that "Health is a condition under which an individual is able to mobilize all his resources, intellectual, emotional and physical, for optimum living. Thus, health is not static. On the contrary, it fluctuates on a scale which ranges between optimum healths as defined by WHO to complete lack of health. WHO (1986)[14] revealed that health is not only a bio-medical phenomenon, but one which is influenced by social, psychological, cultural, economic and political factors of the people concerned. These factors must be considered in defining and measuring health. Thus, health is both a biological and social phenomenon. This is known as psychological concept of health. Angela Scriven (1989)[15] viewed health holistically and its positive aspect was acknowledged. In his view, health should not be primarily considered as an end in its own right, but rather as a means to an end. i.e. the achievement of a socially and economically productive life. For Hema *et al.* (1993)[16], health is a multi dimensional phenomenon. It is not only about disease and medical care system but also about environment around us, which influenced the mental and physical state of person. According to Agnihotri (1998)[17], "health is not a medical artifact, nor can it be equated with politics or economics. It is the social system in which we live, our life styles and living conditions at home.

According to Park (2000)[18], "health is not mainly an issue of doctors, social service and hospitals. It is an issue of social justice. Rexford Santerre (2000)[19] stated that "Health is a nebulous concept that defies precise measurement". In terms of measurement, health depends much on the quantity of life ie the number of life years remaining as it does on the quality of life. But economists take a radically different approach. They view health as a durable good or type of capital, which provides services. The flow of services produced from the stock of health 'capital 'is consumed continuously over an individual's life time (Gross Man, 1972)[20].

Thus, a general distinction can be made between negative and positive definitions of health. Health is viewed largely in negative terms as the absence of disease or illness. Positive health could be described as the ability to cope with stressful situations, the maintenance of a strong social support system, integration with community, high morale and life satisfaction, psychological well-being and even levels of physical fitness as well as physical health. (Bowling, 1991)[21].

2.2. Nature, Meaning and Effectiveness of Primary Health Care

The Alma Ata conference defined primary health care as "essential health care based on scientifically sound and socially acceptable methods and technology made universally acceptable to individuals and families in the community through their full participation and at a cost that the community and country can afford to maintain at every stage of their development of in a spirit of self reliance and self determination" (WHO, 1978)[22]. It forms an integral part both of the country's health system of which it is the nucleus and of the over all social and economic development of the community (WHO, 1979)[23].

38

There are different ways of defining primary health care. The 28th World Health Assembly accepted the working definition of primary health care. According to this definition, Primary health care is taken to mean "A health approach which integrates at the community level all the elements necessary to make an impact upon the state of health of the people." Such an approach should be an integral part of the national health care system which includes preventive promotive curative and rehabilitative health measures and community development activities. (WHO, 1977)[24].

According to Coleking (1981)[25], "Primary Health Care is both a philosophy and a strategy". Its philosophical merits derived from the principles it espouses, while its strategy consists of broad based activities within and beyond the health sector aimed at the improvement of health.

In the words of Segall (1983)[26] "Primary Health Care incorporates certain democratic principles such as community involvement, individual and collective responsibility for health and self reliance. These imply that implementation of health policy cannot be left to the mechanization of the state to formulate programs.

Abel Smith (1983)[27] while analyzing health care expenditure in terms of primary , secondary and tertiary levels stated that "Primary Health Care covers all health Variables that influence health such as education, nutrition, safe drinking water and sanitation." A practical definition of primary health care was suggested which includes "All health care from the village or urban community level up to the health center or first line hospital."

In the opinion of Biswanath Roy (1996)[28] Primary Health Care implies the development of socio economic condition which leads to general improvement of health: Primary health care is more social in nature than personnel. So the primary health care is basically a public good. Though primary health care strategy was introduced to provide acceptability and affordability to all, study observed that the goal of health for all is receding more distant and the poor is deprived of the basic health needs as earlier. Primary health care at the global institutional level should be the focal point to attain health for all.

2.3. Effectiveness of Primary Health Care at the National and Local Levels

There should be empirical regularities at both the national and local levels to make inferences regarding the impact of public spending on primary health to promote good health. It might seem odd that we do not review the literature evaluating primary health care .As one recent review of that literature highlights, however, the literature does not permit such an evaluation. Fox (1995)[29] analysed 87 articles published in four health journals (Health policy, Health Policy and Planning, International Journal of health Services, and social science and Medicines) that included the word "Primary Health care"stated that "While there are questions about parts of primary health care, there was no serious questioning in the literature of primary health care as a desirable way of Ministries of Health to spend their money. Most of the program evaluations or topic evaluations don't show great technical expertise in evaluation methodology being applied to primary health care, but a fair number of articles discuss how such an evaluation would be done, or why it would be difficult."

2.4. Comparison at the National Level

Cross national studies of health status have come to fair consensus on two points. First, socio economic characteristics explain nearly all of the variation in mortality rates across countries, (Filmer, *et al.* 1999). Second, total public spending on health has had much less impact on average health status than one could have hoped for. (Musgrave 1996).[30]

Using instrumental variables to account for data and endogenity problems, Filmer *et al.* (1999)[31] found that public expenditure on health as a share of GDP is a small and statistically insignificant determinant of child mortality and the doubling of public spending from 3 to 6 % of GDP would improve mortality by only 9.13 %. Bidani and Ravallion (1997)[32] show that public spending has a large impact on the health status of the poor, but they estimate the effect of public spending on aggregate health status (to the poor and non poor taken together) to be quite small. There are some exceptions to the above. Anand and Ravallion (1993)[33] stated that the very high correlation between average income and poverty explains that a country's average income explains most of the variations in health status.

An influential study (Preston 1980)[34], based on data from 1940 to 1970, emphasized the low explanatory power of socio economic variables. The cross national evidence has always been absent or ambivalent on whether health status is improved by a greater commitment to or greater spending on primary health care or both (Deon Filmer, *et al.*, 2000)[35]. Kunstadter (1985)[36] participating at a seminar conference that affirmed support for primary health care on the basis of case studies of China, Costa Rica, Kerala and Sri Lanka committed: "The four

case studies involve societies in which low mortality has been reached without per capita income. Situations in which low income continues to be associated with high mortality were not considered, nor have searches systematically for other societies in which relevant social characteristics of the four successful cases are repeated, to see what happened to mortality. Thus policy prescriptions are weak."

More over, although China's bare foot doctors are famous, it is not obvious that their success can be attributed to a primary health care strategy- nor even that it was related to medical care. The largest decline in infant mortality occurred in the 1950s and the first half of the 1960s, before the introduction of the bare foot doctors in late 1965. Further, when the program was abandoned, health status did not deteriorate(Liu *et al.*, 1995)[37]. These are weak evidence against primary health care. "We know of no published cross national evidence that lends support to primary health care" (Filmer *et al.*, 1998)[38].

2.5. Outcomes at the Local Level

A second empirical regularity that would support primary health care would be evidence that the availability of primary health care facilities or community health workers had a demonstrable impact on the local health status of individuals and communities. Frankenberg (1995)[39] by comparing randomly matched births from two different age cohorts in a village in Indonesia finds that the presence of a maternity clinic or a doctor reduced mortality but that the presence of a health worker other than a doctor reduced mortality but that the

presence of a health worker other than a doctor increased the probability of death.

Paris and Lillard (1994)[40] found that delivering a baby with in a health care institution in Malaysia reduced the probability that the baby would subsequently die. In Malaysia, Da Vanza (1984)[41] found that the distance to medical care was related to infant mortality rate, but that low birth weight was correlated with the distance to care. Hammer et al. (1995)[42] found that public medical facilities in Malaysia were unrelated to mortality, where as Hossain (1989)[43] reported that the pressure of a dispensary and family planning clinics lowered mortality in Bangladesh. Rosenzweig and Schultz (1982)[44] showed that rural health posts, municipal, public and private clinics dispensaries and mobile care units were not significantly related to child mortality in rural Colombia. In urban areas, hospitals, clinics and family planning centers tended to reduce mortality. Rosenzweig and Wolpin (1982)[45] used data from rural India to find that villages in a district with a family planning clinic and those with a dispensary were associated with lower child mortality but that villages with any other health facility (health centers, nursing homes etc,) were associated with higher mortality. The large National Family Health Survey of India showed no relation between health center or sub center and child mortality (World Bank, 1998) [46]

Based on the empirical results Deon Filmer et al. (2000)[47] suggested that enhancing health out comes is not simply a matter of providing additional funds or increasing access to primary health care services and facilities. These provide two likely explanations for the negligible impact of public spending: First, the impact of primary health care provision depends on the effectiveness of the

43

service produced. The solution is an improvement in the quality of the services. Second, the impact of the service depends on individual choice and the market for health. Primary health care may have little impact on health status not because such case is unimportant but because, in practice, the efficacy of government health interventions may be low. Study argued that increase in public spending in primary health care are effective in improving aggregate measures of health status, while curative services at secondary and tertiary levels are not. This view can rationalize an increase in funds for primary health care as well as reallocation of the health budget toward primary health care activities.

Kenneth Lee and Annee Mills (1983)[48], based on a number of demonstrations stated that the provision of primary health care can do much to improve health, especially of mother and children. Yet the health services of most developing countries still concentrate their resources and efforts on hospitals which are not accessible for the majority of the population n rural areas and urban slums. Djukanovic and March (1975)[49] stated that primary health care aims to improve the basis of health, implying the distribution of resources to maintain health. This distributive aspect makes primary health care a profoundly political issue. The five case studies in India, Thailand, Jamaica, Sri Lanka indicate that primary health care strategy need to be combined to prevent the emergence of problems associated with the development strategies and life styles that foster conditions of ill health (WHO, 1984)[50]. Santhosh Mehrotra and Richard Jolly (1997)[51] by studying the experiences of ten developing countries that have achieved high health status with low income stated that these countries achieved major reductions in mortality of mother and children by focusing their primary health care activities on maternal and child health. If primary health care is properly focused on preventive and educative medicines, and if cases are

caught before they become serious, and if expanded services are brought closer to the people, primary health care will be superior to hospital care in three ways. It will reduce pain, it will reduce waiting and it will reduce cost. Panchamukhi [52] in her study concluded that emphasis in planning will have to be based on the provision of clean water supply, environmental sanitation, and at least the minimum of medical facilities in the villages of the backward health status , for there is a tendency for the available health facilities to concentrate these also in the urban areas. The role of the primary health center will have to be activated in this direction. According to the Ninth plan document (1997-2002) [53], two important areas which need closer scrutiny in a perspective on health are its approach to primary health care and to disease control program. The existing primary health care institution, according to the document are functioning sub-optimally because of inappropriate location, poor access, lack of maintenance, lack of funds, drugs etc. The primary health care units have been in a shamble as revealed in the plan document.

Finding of a study about leptospirosis epidemic in Gujarat by Purendra Prasad (2000) [54] showed that strategies and efforts undertaken by the government to fight against epidemics were directed towards curative rather than preventive which led to the failure of the health delivery system at different levels. Reputation of primary health centers and community health centers was at the lowest ebb. Efforts should be made to improve the health services in all the government institution rather than attempt a few changes here and there during epidemics. Alan Ghosh (1996) [55] stated that practically no drugs are available in any one of the lakhs of primary health centers which have been set up by the government over the years. There is thus an infrastructure lying unused merely because of the sharp cut back in public expenditure on health.

2.6. Socio Economic Development and Health Status

Improvement in the health status of people requires an integrated approach to deal with various socio economic problems like poverty, unemployment, illiteracy and ill health. Isolated attempt at dealing with any one of these problems are not likely to be very fruitful (Narayanan, 1997)[56].

Since the beginning of the eighteenth century, a crucial factor in mortality decline in Europe was improvement in the supply of food and diet (United Nations, 1975)[57]. Further decline in the mortality rate after the middle of the nineteenth century was contributed significantly by sanitary reforms and public health movements (McKeown and Record, 1962)[58]. Looking at the infant mortality decline experienced by Stonlnitz (1965)[59] considered socio economic factors of lesser importance than public health measures and health facilities. Preston (1975)[60] attempted to prove that 9% of the mortality decline was caused by the socio economic development, as reflected in the changes in nutrition, water system, housing and sanitation. The decline in the prevalence of other disease was ascribed to the public health measures, consisting of immunization and vector control measures. Debabar Banergee (2001)[61] stated that relatively recent improvement in the health status of people in countries like Japan, South Korea, Taiwan, Hong Kong and Singapore can be attributed more to socio economic development than to specific actions of the health service systems. Implementation of health for all is a complex process involving socio cultural political, economic and technological process.

The main focus of development versus public health debate is however centered around the so- called paradox of high status of health at a relatively low

level of development in Sri Lanka and Kerala. In Sri Lanka, mortality decline after the second world war, was attributed exclusively to the public health programs in general and the malaria eradication program in particular (Magm, 1967[62]).

Similarly improvement in the health status of Kerala is generally attributed to the widespread network of health care system in rural areas and its higher utilization rate and/or the public health programs undertaken by the state (Narayanan, 1997)[63]. Nair (1974)[64], suggested that the extension of primary health centers and public health measures in the state led to the decline in infant and child mortality rates in the 1950s and subsequently to fertility decline in 1960s.

On the other hand, Panikar (1975)[65], pointed out that mortality rates had already declined substantially prior to the 1950s and proposed that main factors behind the mortality decline in Kerala were the high priority given to preventive and promotive measures in the health care system, female literacy, better utilization of health care services and the success of public health measures which were introduced on a large scale by the princely States of Cochin and Travancore. He argued that the relative contribution of modern health facilities was small.

A United Nations (1975)[66] study on Kerala's health development concludes that "...... the achievement of Kerala in lowering mortality rate and rising life expectancy to almost the levels of more developed countries must be attributed largely to the widespread net work of health services and the scales on which they are used.

An all encompassing hypothesis was provided by Ratcliff (1977)[67] who saw changes in Kerala's demography as a result of broader socio- economic and political development. Paniker and Soman (1984)[68], laid equal emphasis on public health and medical care services. While the first phase of health status improvement was attributed to preventive health measures against infectious diseases, in the second phase, the stress was on the expansion of medical care system with low rural urban disparities and small size of the catchment areas. They recognized the contribution of land reforms, public distribution system, literacy and housing to the reduction in socio- economic in equalities and better utilization of health care services but attributed health improvement mainly to the health care services. The role of social factors in Kerala's mortality and fertility decline is high lighted in Nag's comparison of that state with West Bengal (Moni Nag, 1983)[69]. Nag drew attention to the early introduction of public health measures, including sanitation and immunization in Travancore-Cochin during the nineteenth century and to the absence of such measure in West Bengal. Nag attributed the high health status to the social development in terms of wider distribution of health care services in the rural areas and their greater utilization, better transportation facilities, higher living especially among women and political awareness all resulting from the public policy.

Zachariah and Patel (1983)[70] compared infant mortality in three district of Kerala and found that infant survival was mostly influenced by mother's education. Kabir and Krishnan (1992)[71] analysed the social , institutional and economic forces that aided the health transition in Kerala, role of government in initiating and sustaining these process and the lessons they provide for other states. Based on various studies it has been proved the critical role of the government in providing access to health and the importance of social and

political changes in bringing about the health transition in Kerala. Another major indirect finding is the importance of preventive and public health measures in reducing morbidity and mortality. Krishnan (1976)[72] found literacy an important variable for explaining interstate differences in mortality rate in 11 state of the country. Again, while he found literacy to be the most significant factor, the health service ratios also had some explanatory power. On the other hand, health expenditure was not a particularly significant explanatory power. Again Krishnan (1976) showed that infant mortality rate of different regions of Kerala were positively correlated with the size of the "catchment area' of health centers. These approaches concluded that economic development is the means to reduce mortality and improve health and the resources spent on health measures are wasted resources and they should be channeled into development from which health will automatically ensue. Dreeze and Sen (1995)[73] states that the political consciousness of the people to demand what they are entitled to, had the effect of making health care much more rapidly available for the poor in Kerala. This account is in sharp contrast with the corresponding state of affairs in UP where widespread absenteeism of government doctors is passively accepted as a normal state of affairs. The role of social and political factors in generating the effective performance of government agencies in Kerala is well described in Heller (1996)[74]. Earlier, Cald Well (1986)[75] described instances in which Keralan's held health workers accountable through armed means.

Ramankutty and Paniker (1995)[76] conducted an in depth study on the pattern and intensity of the reaction of the government health sector in Kerala to the current fiscal crisis. This study reports that public sector health services played an important role to have an exemplary health status attained by Kerala in the early period. But of late, the importance of public sector in the health

services in the state has waned greatly due to fiscal crisis. Performance of the health sector is directly dependent upon the state of its finances

2.7. Problems and Policy Perspectives

Amar Jesani (2002)[77] in his study on 'social objectives of health care services regulating the private sector' had stated that since all the eight elements embodied in the primary health care cannot be provided at a time due to resource constraints, prioritization of elements are needed. Based on previous experience author suggest that minimum health services that should be provided to all will include 1. Maternal and Child Health, 2. Immunization, 3. Treatment of common illness and 4. Provision of essential drugs.

As per this study, quantitative development rather than qualitative development is to be given preference. Study concluded that it is better to have lower quality care for every one and upgrade it gradually than to set up pockets of high technology hospital based on curative services inaccessible to the vast majority of people. Study conducted by Zacharia, Nair, and Irudaya Rajan indicate that more than 70 % of women in Kerala are protected by various family planning methods and among 80 % of them are sterilized. Since Kerala has reached below replacement level of fertility, role of family planning in the state in the near future is insignificant. In this ground, the government can divert money from family planning to social security. Some important issues related to health policy revealed that interventions in the health sector may have to focus on the preventive aspect of health care especially in the areas of safe drinking water and provision of sanitary facilities. (Kannan *et al.,* 1991)[78]. Sen and Dreeze (1995)[79] have noted massive displacement of health care activities by family planning programs. While family planning programs are definitely

important, it should never be at the cost of general health care particularly where the general health care help a lot in progress towards family planning (Biswanath Roy, 1996).[80]

Santhosh Mehrotra and Richard Jolly (1997)[81] presented retrospective studies of ten developing countries that managed to exceed the scope and pace of social achievement of the majority of other developing countries, many of their social indicators being comparable with those of industrialized countries. The study concludes that it is possible to achieve a high level economy, if the government sector sets the right priority. Blerman (1998)[82], in his study 'Rethinking health care system' stated that service priorities such as family planning under public delivery system reduced real access to other services and popular perceptions of quality. Kunnikannan and Aravindan (2000)[83], critically analysed the achievement and future prospects of the most discussed Kerala Model of health development and has revealed that major proportion of resources allotted for health sector are spent on family planning , but not as per the requirements of the community. His study points out the need for developing and prospering the working of primary health care in these areas so as to promote the efficiency of public health sector. According to Sucha Singh Gill (2000)[84], prioritizing rural health care in the state policy by allocating additional investment for sanitary infrastructure and medical personnel in rural areas is essential for redressing the growing disparity in health care facilities between rural and urban Punjab.

Imrana Quadeer (2002)[85], stated that the net work pf primary health health centers do not provide comprehensive primary health care but only family planning service, selected immunization service and selected disease

surveillance. Various studies have observed that family planning and more recently immunisation get only a large share of public resources but also take a disproportionately large share of health worker's effective work time. Ravi Duggal (2002)[86], observed that re-organising resource allocation in a meaningful way is only the first step to improve the health status of population.

2.8. Public Vs Private : Need for Government Intervention

Although health is recogniesd as fundamental human right, the responsibility of state in providing health care services are grossly neglected in many of the world countries (Subramanian, 1997)[87], Jowet (1990)[88] suggested that government health spending is being increasingly substituted by private spending even where economies are growing. No program of social service can be effective without public support and co- operation. This is perhaps more true incase of health services and also the sanitation and cleanliness program may fail to yield desired results for want of public support and co- operation.

Usha Banerjee (1970)[89] stated that, in the absence of public financing, there will not be a socially optimum supply of hospital. Ramamani Sunder (1992)[90], conducted a household survey of health care utilization and expenditure in India in 1993. The results of the survey revealed that the people's dependence on public health facilities is higher for natal, intra natal and preventive care. More than 60 % of the deliveries in both rural and urban areas have taken place in the government health facilities. Dileep (2002)[91], in his paper on 'Reproductive and Child Health Care Service' attempted to understand the role of private sector in providing reproductive and child health care service in India. Study concluded that majority of services that come under the

52

reproductive and child health care is relatively cheaper, which in most cases do not involve hospitalization. Therefore, at a policy level, the public sector should consider the potential of private sector in delivering reproductive and child health services at least in places where knowledge and use of these services have been universal.

Brain Abel Smith (1999)[92], in his study about how to improve health in a cost effective and politically acceptable way stated that private sector is the long term answer to the provision of health care since public services are bound to be inefficient, bureaucratic and impersonal. Because the private sector has to respond to market forces, it will be more efficient and user friendly. But in many countries, private sector is generally regarded by the public sector as a dangerous predator, robbing the public sector of trained workers, distracting doctors by its higher earnings from their main work which ought to be in the public sector.

NSSO (1998)[93], stated that rise in the role of private sector providers is expected to decrease burden on the government. The profit oriented private sector is not only a major contributor of both inpatient and out patient care services, but their perception in the delivery of health services in India is showing an increasing trend as well. Based on the experiences from different states, Nair *et al.* (1999)[94], stated that even though rise in the role of the private sector in family planning services is not a pre- requisite for the fertility decline, it can relieve the public sector from the burden of reproductive and child health care. Pillai (1999)[95], traced out the development of Kerala economy from 1951-1991 and investigates into the role of 'Kerala Model'. According to him, the role played by the private sector in the medicare system is quite significant and its

contribution to Kerala's health status is much more than that of the government sector. While looking for explanations for the high level health status of the state, usually the big role played the private sector in this area does not get recognized. Krishnan (1999)[96], in his study stated that private sector has played a major role in the health care delivery since 1975 in Kerala. Provision of financial incentives for the private sector to establish and operate educational institution plated an important role to reduce the disparity and to promote health. Immunisation survey indicate that nearly $1/3^{rd}$ of the total number of child immunusation and over half the number of TT immunization was given by the private physician in 1991. Ravi Duggal (2002)[97], stated that private sector cannot be left to its own means and ways. It needs to be integrated under a common umbrella along with the public health system. Based on the world wide experience, author concludes that to attain universal access to health, an organized public private mix health care system has to evolve.

According to Mavalankar (1996)[98], Quality of service is a major factor that influence the client in choosing a health care provider. Researches in family planning services assume that women may be preferring the private sector because of superior quality of services when compared to the public sector. Kannan et al. (1991)[99], stated that public health care institutions have played a crucial role in the health care in the early decades but since 1980's there has been rapid expansion in the health care facilities in the private sector. Low rate of utilization of public health care even among the poor show poor performance of public health institutions and the preventive health care aspects in the public institutions does not seen to get the attention they warranted.

Irudaya Rajan (1995)[100], in his study on major issues in the health status of Kerala pointed out that utilization as well as the development of private sector has become a vital factor in Kerala especially in 1980s. Another amazing finding is the utilization of private institutions by the socio-economically poor sections of the population which indicate the health consciousness among Keralites and the poor performance of public health care institutions. United Nations (1992)[101], while analyzing ageing problems of Kerala and its implications for policy making showed that employment opportunities for physicians in the government sector may not increase proportionately with the increase in number of physician. Many doctors may have to look for employment in the private sector. This may widen the already existing gap in perceived quality of care between the government and private sector, with the government facilities seen to over crowed and under staffed compared to private hospitals.

Ravi Duggal (2002)[102], in a critical study on draft national health policy of 2000 emphasised high correlation between decline in the share of public sector utilization and the reduction seen in expenditure on the non salary components of health budgets. He concluded that in order to increase rate of utilization of public health facilities from current level of less than 20%, expenditure on non- salary components of the health budget is to be increased.

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CHAPTER 3

AN OVER VIEW OF THE WORKING OF PRIMARY HEALTH CARE SYSTEM: INDIA AND KERALA

In this chapter an attempt is made to have an understanding of the working of primary health care system in India and Kerala. First part of this section focuses in brief on the health planning in India. Infrastructure development in primary health care is discussed in the next part followed by a brief note on preventive and promotive measures in Kerala and India.

3.1. Health Planning in India

Health planning in India is an integral part of national socio economic planning. The Alma-Ata declaration on primary health care and the National Health Policy of the Government gave a new direction to health planning in India, making primary health care the central function and main focus of its national health system. India was one of the pioneers in health service planning with a focus on primary health care. The guidelines for national health planning were provided by a number of committees dating back to the Bhore Committee. A brief description of the reports of these committees are discussed below.

Bhore Committee, (1946) –A landmark

In 1946, the Health Survey and Development Committee, headed by Sir Joseph Bhore recommended establishment of a well structured and comprehensive health service with a sound primary health care infrastructure.

The committee visualized the development of primary health centers in two stages. (a). As a short-term measure, it was proposed that each primary health center in the rural areas should cater to a population of 40000 with a secondary health center to serve as a supervisory, coordinating and referral institution. For each primary health center, two medical officers, 4 public health nurses, one nurse, 4 midwives, 2 sanitary inspectors, 2 health assistants one pharmacist and 15 other class 1V employees were recommended. (b) As a long term measure, it was recommended to set up primary health units with 75 bedded hospitals for each 10000 to 20000 population and secondary units with 650-bedded hospitals and district hospitals with 2500 beds.

Mudaliar Committee (1962)

In 1959, the Government of India appointed another committee known as 'Health Survey and Planning Committee'. This committee found the quality of services provided by the primary health centers inadequate and advised strengthening of the existing primary health centers before new centers were established. It also advised strengthening of sub divisional and district hospitals so that they may effectively function as referral centers.

Chadah Committee (1963)

The Committee recommended that the 'vigilance' operation in respect of the National Malaria Eradication Programme should be the responsibility of the general health services. i.e. primary health centers. The Committee also recommended that the vigilance operation through monthly home visits should be implemented through basic health workers. One basic health worker per

10000 populations was recommended. These workers were envisaged as "multipurpose" workers to look after additional duties of collection of vital statistics and family planning.

Mukherjee Committee (1965)

A committee known as 'Mukherjee Committee' under the Chairman ship of Shri Mukherji, the then Secretary of Health to the Government of India, was appointed to review the strategy for the family planning programme. The committee recommended separate staff for the family planning programme. The family planning assistance were to undertake family planning duties only. The basic health workers were to be utilized for purposes other than family planning.

Mukherjee Committee (1966)

The Committee worked out the details of Basic Health Services which should be provided at the block level, and some consequential strengthening required at higher levels of administration.

Jungalwalla Committee (1967)

The Committee recommended integration from the highest to the lowest level in the services, organization and personnel. The main steps recommended towards integration were Common seniority, recognition of extra qualification equal pay for equal work, special pay for specialized work, no private practice and good service condition.

Kartar Sing Committee (1973)

Major recommendations of the committee were (a) for proper coverage, there should be one primary health center for a population of 50 000, (b) each primary health center should be divided in to 16 sub-centers each having a population of about 3000 to 3500 depending upon topography and means of communications, (c) each sub-center should be staffed by a team of one male and one female health worker, (f) there should be a male health supervisor to supervise the work of 3 to 4 male health workers: and a female health supervisor to supervise the work of 4 female health workers and (g) the doctor in charge of a primary health center should have the over all charge of all the supervisors and health workers in his area.

Shrivastav Committee (1975)

Committee recommended establishment of two cadres of health workers, namely multi purpose health workers and health assistants between the community level workers and doctors at the primary health centers, development of a 'Referral Service Complex' by establishing proper linkages between the primary health center and higher level referral and service centers. The committee felt that one male and one female health worker should be available for every 5000 population. Also, there should be one male and female health assistant for two male and female health workers respectively. The health assistants should be located at the sub center, and not at the primary health center.

Rural Health Scheme (1977)

In 1977, the Government launched a Rural Health Scheme, based on the principle of "placing people's health in people's hands". It is a three tier system of health care delivery in rural areas based on the recommendation of the Shrivastav committee in 1975. Close on the heels of these recommendations an international conference at Alma-Ata in 1978, set the goal of an acceptable level of Health For All the people of the world by the year 2000 through primary health care approach. As a signatory to the Alma-Ata Declaration, the Government of India is committed to achieving the goal of Health For All through primary health care approach which seeks to provide universal comprehensive health care at a cost which is affordable.

National Health Policy (1983)

Keeping in view the WHO goal of Health For All by 2000 AD, the Government of India evolved a National Health policy based on primary health care approach. It was approved by parliament in 1983. The National Health Policy has laid down a plan of action for reorienting and shaping the existing rural health infrastructure with specific goals to be achieved within 1985, 1990 and 1995 within the frame work of sixth and seventh plan and new twenty point programme

National Health Policy (2001 and 2002)

The National Health Policy 2001, the first since 1983, though announced health as State's responsibility, pointed out that the growing

70

constraints in the State's resources has resulted in shrinking health sector budget. National Health policy 2001 had identified availability of medicines at the primary care level as the reason for the relatively better utilization of public health centers in the southern States. The policy documents had envisaged the 'kick starting of the revival of the primary health care system by providing some essential drugs under central Government funding through the decentralized system.

The basic objective of National Health Policy 2002 is to achieve an acceptable standard of good health amongst the general population of the country. The State Health System Department projects are under implementation in the States of Karnataka, West Bengal, Punjab, Orissa, Maharashtra and Uttarpradesh, with World Bank assistants. The focus of the programme is on strengthening the health care delivery system at secondary level and integrating with the primary health care delivery system for improving health care services.

Various steps have been undertaken to implement the National Health Policy. They are:

a. *Village Level*

One of the tenets of primary health care is universal coverage and equitable distribution of health resources. That is, health care must penetrate into the farthest reaches of rural areas and that every one should have access to it. To implement this policy at the village level, the following schemes are in operation.

(i) Village Health Guides

A village Health Guide is a person with an aptitude for social service and is not a full time Government functionary. The duties assigned to health guides include treatment of simple ailments and activities in first aid, mother and child health including family planning, health education and sanitation. They are expected to do community health work in their spare time of about 2 to 3 hours daily. The scheme was launched in all States except Kerala, Tamilnadu and Karnataka.

(ii) Local Dais

Most deliveries in rural areas are still handled by untrained dais who are often the only people immediately available to women during the peri natal period. An extensive programme has been undertaken, under the Rural Health Scheme, to train all categories of local dais in the country to improve their knowledge in the elementary concepts of maternal and child health and sterilization besides obstetric skills.

(iii) Anganawadi Worker:

'Angan' literally means a courtyard. Under the ICDS scheme, there is an anganwadi worker for a population of 1000. There are about 1000 such workers in each ICDS project. The anganwadi worker is selected from the community she is expected to serve. She undergoes training in various aspects of health, nutrition, and child development for four months. Along with health

guides, the anganwadi workers are the community's primary link with the health services and all other services for young children.

b. Sub-center level

The sub-center is the peripheral out post of the existing health delivery system in rural areas. They are being established on the basis of one sub-center for every 5000 population in general and one for every 3000 population in hilly, tribal and backward areas. Each sub-center is manned by one male and one female multi purpose health worker. At present, the function of a sub-center are limited to maternal and child health, family planning and immunization. The work at sub-center is supervised by male and female health assistants. According to the revised norms, one female health assistants will supervise the work of 16 female health workers.

c. Primary health center level

The primary health care infrastructure provides the first level of contact between the population and health care providers up to including primary health care physicians and forms the common pathway for implementation of all the health and family welfare programmes in the country. It provides integrated promotive, preventive, curative and rehabilitative services to the population close to their hearth and home. Majority of the health care needs of the population is taken care of by the trained health personnel at the primary health care level. Those requiring specialized care are referred to secondary or tertiary care facilities with adequate referral linkages will provide essential health and family welfare services to the entire population.

d. Community health centers

The present primary health centers, while serving a population of 50000 to 60000 will also function as referral center. The suggestion of the Government of India is to convert all the block primary health centers into community health centers provided they have certain minimum facility. The community health centers should have a minimum of 30 beds, X-ray facilities, operation theatre, laboratory and some specialty services. The community health centers will function as a referral center for 4 to 5 primary health centers, in addition to being the direct action center for 50000 to 60000 populations.

3.2. Rural Primary Health Care Infrastructure

At the time of independence, health care services were mainly urban centered and hospital based. Realizing the importance of creating a functional primary health care infrastructure, national norms for the primary health care infrastructure were drawn up. These take into account the population, population density and terrain.

Earmarked funds were provided under the Minimum Needs Programme in the State plan allocations. The funds received from the Department of family Welfare and through the externally assisted projects were utilized to build up the Rural Health Infrastructure. In rural areas services are provided through a network of integrated health and family welfare delivery system. As on 31st March 2004 an extensive network of 3043 community health centers, 22842 primary health centers and 137311 sub-centers were in existence to provide primary health care at grass root level. Further, 8669 new sub-centers were

sanctioned during the year 2003-04. One sub-center manned by one female and a male multipurpose worker covers a population of 5000 in plain areas and 3000 in hilly, tribal and backward/difficult terrain areas. One lady Health Visitor supervises six sub-centers. One primary health center covers a population of 30000 in the plain areas and 20000 in tribal and difficult terrain areas. One community health center covers 80000 to 120000 populations. It has 30 indoor beds, well equipped laboratory and X-ray facility[1] (Table 3.1).

Table 3.1.

Health Care Infrastructure

Items	1951	1961	1971	1981	1991	1992	1993	1996	Current level 2004
Sub Center	0	0	28489	51406	130984	13178	131586	132736	137311
PHC	725	2565	5112	5740	20450	20719	21030	21854	228442
CHC	0	0	0	217	2071	2193	2289	2424	3043
Dispensaries	6515	9406	12128	167551	27431	27403	NA	28225	38031 (2002)
Hospitals	2694	3094	3862	6804	11174	13692	NA	15097	--
Beds	117198	230000	348655	569495	810545	834650	NA	870161	914543 (2003)

Source 1. Economic survey: Government of India: Various issues. Ministry of Finance, Economic Division

2. Rural Health Statistics, June 1996

3. Health Information.

4. India: 2005, Ministry of Information and Broadcasting, Government of India, published by the Director, Publications divisions.

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[1] India 2005: Ministry of information and Broadcasting Government of India. p.378

Unlike the sub-center and Primary health centers, the number of functioning community health centers, which form the First Referral unit, was reported in the ninth plan far below the projected requirements. Ninth plan intended to fill this gap quickly so that primary health centers and sub-centers do have a near by referral hospital for the management of high-risk patients who are referred. In most of the State there are sub district and Taluk hospitals. With the restructuring of the primary health care institutions in the seventh plan, these institutions were to be re-designated as community health centers and suitably strengthened. The eighth plan had also reiterated this strategy. States that had implemented this suggestion report that these first referral units are well utilized, as they are located in town that are well connected with villages by transport and are well known. During the ninth plan, all the States are directed to restructure the existing sub district, Taluk hospitals and block level primary health centers into functioning community health centers. It was expected that once this restructuring is completed, the current large gaps in functioning community health centers will be narrowed substantially. Similarly the existing rural hospital and dispensaries are restructured to meet the requirements in primary health centers. It was reported in the tenth plan that in spite of impressive rural primary health care infrastructure, public health care infrastructure is catering to only 20 % of all health care needs of the population.[2] National Common Minimum Programme envisaged raising public spending on health to at least 2-3 per cent of GDP with focus on primary health care. The Department of Family welfare is planning to improve access to primary health care in rural under served areas and urban slums, both through revamping of the public health care infrastructure and activation of public-

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[2] India 2005: Ministry of information and Broadcasting Government of India. p.378

private partnership during the phase II of the Reproductive and Child Health Programme (RCH) due to be launched in April 2005[3].

3.3. Health Manpower in Rural Primary Health Care Institutions

As per the national norms, one male and female multi purpose worker should be available at the sub center catering to the health needs of 3000 to 5000 population. The number of sanctioned posts of male multi purpose worker is only half the number required (10th plan documents). This has been cited as one of the major factors responsible for the sub-optimal performance in health sector programmes. There are large number of male workers employed in the malaria, leprosy and TB control programme. The plan recognized the need to be trained these and redeployed as male multipurpose workers and given the responsibility of looking after health and family welfare programme in their sub-center area. The availability of the female multipurpose worker in adequate number has been the major factor for the near universal coverage under the immunization programme and improvement in ante natal care, however, the quality of care provided needs improvement. The vaccines as well as the lack of sanctioned posts of radiographers, lab technicians and other para-professionals have adverse impact on ongoing health and family welfare programme.

During the ninth plan, several of the centrally sponsored schemes including Family Welfare Programme, Revised National Tuberculosis Control Programme, National Malaria Eradication Programme provided funds for recruitment of appropriate manpower funds provided under Act for Basic Minimum Services (BMS) may also be utilized to fill the critical gaps in health

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[3] The RCH 11 aims at assessing success of the various interventions by way of performance outcomes for vulnerable population groups, for which specific performance indicators are being developed.

manpower. Every district is directed to undertake district level manpower surveys and planning, so that funds from all these sources are optimally utilized to fill the existing gaps in vital manpower and unnecessary duplication is avoided.

Previously, the national norms for manpower requirements have been computed on the basis of population. During the ninth plan, the requirement of personnel is computed not only on the basis of population, but also on the basis of work load, distance to be covered and difficulties in delivering of health services. A flexible approach to recruitment of staff, if necessary on part time basis is decided to adopt to ensure that programmes do not suffer due to lack of key personnel.

Physicians in PHCs

The PHC doctors at the national level exceed the requirement as per the norms (ninth plan). However, there is marked difference in their distributions. About 10% of Primary Health Centers are without doctors, while a similar number have three or more doctors. The primary health centers (PHC) with out doctors are mostly located in remote areas where health care facilities under voluntary or private sector are also limited. The State Governments are taking steps to re-deploy the PHC doctors so that needs of the population in under served areas are met on a priority basis. A substantial proportion of specialist posts even in the functioning Community Health Centers (CHC) are vacant. Hence, these community health centers are unable to function as FRU. In view of the serious implications of this lacuna in the establishment of referral system, as well as effective provision of health, maternal and child health, family

planning care, various measures have been implemented in the ninth and tenth plan. Improving the service condition and providing a conducive environment was considered essential to ensure that specialist in CHCs do stay and provide the needed services. At the moment, there is no post of public Health Specialist or Anesthetist in the CHCs. Services of Anesthetist are found to be vital for emergency/ routine surgery in CHCS. Under ninth plan efforts were made to provide this critical manpower. Plan also envisages posting specialist in CHCs who will be responsible for curative services.

The new primary health centers with a population of 20,000 to 30,000 will have to be provided with minimum facilities like

1   10 inpatient beds

2   Well organized OP Department with facilities for accident treatment and laboratory

3   Adequate provision of food and drugs

4   Adequate supporting paramedical and office staff

5   Immunization facilities

6   Maternal and Child health services

7   Health education programmes and tools

8   Vehicles and

9   Office

The suggestion of the Government of India is to convert the entire block PHCs into Community Health Centers provided they have certain minimum facility. The CHCs should have a minimum of 30 beds, X-ray facilities, Operation Theater, laboratory and some specialty services. The CHC will

function as a referral center for 4 to 5 PHC, in addition to being the direct action for 50,000 to 60,000 populations.

From the point of view of the functional structure of a PHC, it should have the following minimum facilities.

a. At least three Medical Officers, including a Lady Medical Officer.
b. Adequate OP facilities including accident treatment and pediatric facilities.
c. Operation theatre and labor room
d. Laboratory room service.
e. Supportive paramedical staff
f. Adequate provision for food and medicine.
g. Minimum staff required for office work and supervision (IUD clerk, one clerk and one typist)
h. Vehicle
i. Health surveillance
j. Maternal and Child care facilities
k. Facilities for family welfare programme

The health team has no meaning as a mechanism for community welfare unless its members by working together reach the grass root levels of the local population directly.

Job description of staff of a PHC

1. Medical Officer: He is the captain of the health team at the primary health center. He devotes the morning hours attending to patients in the out door; in

the after noon he supervises the field work. He visits each sub-center regularly on fixed days and hours and provides guidance, supervision and leadership to the health team. He spends one day in each month organizing staff meeting at the primary health center to discuss the problems and review the progress of health activities. He ensures that national health programmes are being implemented in his area properly. The success of a primary health center depends largely on the team leadership which the Medical Officer is able to provide. The Medical Officer must be the planner, the promoter, the director, the supervisor, the coordinator as well as the evaluator.

2. The Health Supervisor and Lady Health Supervisor: The jurisdiction of a health supervisor /lady health supervisor is the whole area of the PHC to which they are attached. They assist medical officer of PHC in organizing and implementing various health and family welfare programmes including mass campaign. They collect reports from all health inspectors and maintain a consolidated register and record all information regarding field activities and report to the charge medical officer.

3. Health Supervisor (Male): The important functions of Health Supervisor (M) are:
   1. Be in charge of block level health and family welfare education activities
   2. Give necessary guidance and assistance to health workers and lady health workers.
   3. Organize special strategies for education purpose in respect of specific and special programmes.
   4. Render necessary assistance to District level education officers for the various education programmes in respect of health and family welfare.

5. Investigate out break of communicable disease and furnish the report to the concerned Medical Officer.

6. Conduct monthly staff conference at PHC

7. Verify and supervise the periodicity of visit of lady health inspectors and lady health workers in the field.

4. Health Supervisor (FM):

❖ Supervise and coordinate the work of lady health inspectors and lady health workers.

❖ Render necessary administrative assistance to Medical Officers

❖ Be in charge of organizing and implementing the immunization programme of school children as a part of school health and render necessary assistance for the same.

5. Health inspectors and lady health inspectors

Jurisdiction of a health inspector/lady health inspector is over the area of a 4(3to5) health workers and supervisory control is over those health worker or lady health worker as the case may be.

6. Health inspector (M):

❖ Carry out concurrent and consecutive supervisory house visit in the area of health worker

❖ Keep vigilance to detect out break of communicable disease like cholera, gastroenteritis, malaria etc,

❖ Give radical treatment for positive malaria cases

❖ Supervise spraying of insecticides

❖ Help community for activities for improving environmental sanitation.

❖ Conduct inspections of places of dangerous offensive traders including eating and drinking places where food items are prepared.

❖ Supervise chlorination of water sources.

7. Health Inspector (FM):

❖ Cary out concurrent and consecutive supervisory house visits and sub-center visits in the area of lady health workers

❖ Conduct MCH and family planning and carry out educational activities

❖ Visit each of the sub-center at least once in a week in fixed days.

❖ Responds to urgent calls from lady health workers and render necessary help.

❖ Motivate personally resistant care for family planning.

❖ Provide information on availability of services for medical termination of pregnancy

❖ Render assistance for medical examination of school children.

❖ Health worker Male and Female

Under the Multi purpose Worker Scheme, one health worker female and one health worker male are posted at each sub-center and are expected to cover a population of 5000 (3000 in tribal and hilly area). However, health worker female limits her activities among 350to 500 families.

8. Health Worker Grade 1 & 11 (Male):

❖ Make one visit in a month to each family on the allotted area and maintain family and village records.

❖ Implementation of health programmes

❖ Implementation of family planning and MCH programmes

❖ Control of communicable diseases

❖ Health and family welfare education

❖ Nutrition service

❖ Immunization

❖ Collection of details of vital events

❖ School health programmes

❖ Medical termination of pregnancy

9. Lady Health Worker Grade I and II

❖ Make at least one visit in a month to each family of the allotted area.

❖ Implement MCH and family planning : Major item included are: Immune pregnant women with tetanus toxoid

❖ provide at least three post delivery visit to each mother and render necessary advice,

❖ distribute conventional contraceptives,

❖ distribute iron and folic acid tablets, vitamin A drops.

❖ Immunisation: Administer DPT, DT, TT, Polio and Typhoid; educate the community about the importance and procedures of immunization.

Monitoring Mechanism

The status of primary health care infrastructure and manpower is being monitored by the department of family welfare. It is also being monitored as a part of the MNP / 20 point programme. The Central Bureau of Health Intelligence monitors the health care infrastructure, manpower and health status of the population. Planning Commission monitors the programme in PHC

infrastructure/ manpower annually during the annual plan discussions. Number of doctors in modern system as on March 2004 was estimated to be 6,25,131[4].

3.4. Kerala

Health is a State subject under the Indian constitution, and the responsibility for providing health services lies with the State's Department of Health and Family Welfare. The Department is headed by a minister of Cabinet rank. At the District level, the health organization is under control of the District Medical Officer, assisted by District Deputy Officer and looking after special concerned programmes in the District. There is a District Immunization Officer in all the districts of Kerala to look after the immunization activities in the district. Kerala has district hospitals in all the districts of the State where curative services are provided. In all the district hospitals there are specialists care available like Pediatrics, ENT, Ophthalmology, Obstetrics, and Gynecology, general surgery .and general medicine.

The Minimum Needs Programme of Health Service Department gives priority to the development of rural health services. The establishment of sub-centers, primary health centers, up gradation of primary health centers and construction of buildings for primary health centers /sub-centers and staff quarters are included in the programme. The Integrated Department of Health Services perform the chief function of delivery of primary healthcare in a whole some manner, and the attainment of preventive family welfare including maternal and child health and promotive health care in addition to the routine curative services and rehabilitative aspects of health care constitute the main

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[4] Medical Council of India: Planning Commission, Ministry of Health and Family Welfare

activities of the department. The activities include the establishment and maintenance of medical institutions with necessary infrastructure, control of communicable disease, rendering of family welfare service including MCH services, implementation of National Control/or eradication programme and administration of the directorate.

3.4.1. Health Infrastructure

The access to institutional care and health manpower development has largely contributed to the unique position. Kerala has a vast infrastructure which has remarkably contributed to the attainment of the present health standards. A trend analysis of the allopathic infrastructure under government sector would show that at the commencement of the first five year plan, the State had 230 institutions. This has increased to 963 in 1981, 1249 in 1994 and 1310 in 2003. An analysis of 2003 position further bring out that in 2003, there were 933 (72%) primary health centers, 115 (9%) community health centers, 130 (10 %) hospitals and 121 (9 %) dispensaries and other institutions including grants in aid institutions.

As regards accessibility of institutions, there is a sub center for every 5000 persons as against 4581 at the All India level. Primary health center on an average serves a population of more than 2500 and each community health center serves a population of about 2.25 lakh in Kerala. For every 6.16 sq.km, in the State, there is one primary health center. The accessibility to health infrastructure and services is higher as compared to other States and India. Average bed in primary health center is 5.4 at State level. Community health centers are rural based hospital above primary health center. National pattern of

community centers is 30 beds and 5 specialties. In Kerala, the average beds in Community Health Center is 40 and it varies from 29 in Kasargod to 51 beds in Palakkad. Eighty percentage beds are in urban areas and twenty percentage are in rural areas. Average hospital beds under Directorate of Health Service in Kerala are 174 and it varies from 91 beds in Pathanamthitta to 264 beds in Kozhikode District.[5]

Table 3.2.

Details of Rural Health Infrastructure in Kerala from 1986 to 2003

Year	PHC		CHC		Sub-center No:
	No	Beds	No	Beds	
1986	299	2886	-	-	2774
1987	444	3400	-	-	3374
1988	577	3274	29	2226	3874
1989	740	3686	29	2292	4374
1990	883	4480	54	3127	5094
1991	908	4714	54	3159	5094
1992	907	5031	54	3216	5094
1993	918	5116	54	3285	5094
1994	924	5228	51	2772	5094
1995	940	5371	52	2797	5094
1996	961	5338	60	3007	5094
1997	956	5100	80	3442	5094
1998	962	5253	80	3348	5094
1999	944	5009	105	420	5094
2000	944	5009	105	4202	5094
2001	943	5215	105	4415	5094
2003	933	5060	115	4726	5094

Source Economic Review 2001, 2003

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[5] Ecnomic Review. Kerala: 2003

3.4.2. Private Sector Plays a Vital Role

The discussion on the health infrastructure is only partial of mention is not made about the private health infrastructure which plays a vital role. A survey conducted by Department of Economics and Statistics revealed that there were 3565 private allopathic institutions with about 50,000 beds in the State. Number of beds in public sector increased from 36000 to 38000 in public sector from 1986 to 1996 showing an increase of 5 % whereas in private sector, number of beds increased from 49000 to 67000 – an increase of 40 %.

3.4.3. High bed Population Ratio

With the growth of health infrastructure, there has been tremendous expansion of beds in the government sector. The hospital beds increased from 6752 in 1951 to 31206 in 1981 and 46,800 in 2003. The number of beds per lakh population in Kerala in 2003 is estimated to be 160.

3.4.4. Decentralisation of Planning

The process of decentralized planning launched by the State Government during 1997-98 has meant a major change in the approach to planning and development. There are 1226 allopathic medical institutions transferred to local bodies out of which, 938 are primary health centers, 105 community health centers, 63 Government hospitals, 41 Taluk hospitals, and 11 district hospitals. Thus, a total of 2593 medical institutions including ayurvedic and homeopathic institutions have been transferred to local bodies as part of decentralisation. During 1997-98, the local self Government institutions have formulated 5363

projects and allocated Rs. 38.59 crore. Construction of buildings in backward areas received priority and during 1997-2000, 90021 sq.km. of building constructed.

3.5. Preventive measures

Primary health care functions include preventive, promotive and curative measures. An overview of the working of preventive and promotive measures in India and Kerala are discussed here. Working of curative measures is given in the fifth chapter 'Morbidity transition in rural Kerala'.

3.5.1. Working of preventive measures

Preventive measures include methods of family planning and Maternal and child Care.

(a) Family Planning Programme

Family planning refers to the practices that help individuals or couples to attain such objectives as avoiding unwanted birth, bringing about wanted birth, regulating the intervals between pregnancies, controlling the time at which birth occurs in relation to the age of the parents and determining the number of children in the family (WHO 1980). An expert committee (1971) of WHO defined family planning as a "way of thinking and living that is adopted voluntarily upon the basis of knowledge attitudes and responsible decisions by individuals and couples in order to promote the health and welfare of the family groups and thus contribute effectively to the social development of a country WHO (1986).

Family planning is a scientific and planned approach to make the family happier and harmonious. The main appeal for the family planning is the realization of the need for family limitation on a wide scale on the basis of knowledge, attitudes and responsible decision by the individuals and couples in order to promote the health and family and there by contribute to the social development of the country.

(b) Evolution of the India's Family Planning Programme

India launched a nation–wide family planning programme in 1952, making it the first country in the world to do so, though records show that birth control clinics have been functioning in the country since 1930s. The entire first decade of India's family planning programme, which had began with the adoption of first five year plan (1951-56), was a period of very humble and cautious start. Although following the model used by Planned Parenthood organization in the west, the setting up of family planning clinics for those who needed such services (what is known as 'clinic based approach') was visualized, the chief emphasis during this period was on natural method (example: rhythm).

The pace of increase in voluntary contraceptive acceptance by the end of second plan was slow and the record of voluntary attendance in family planning clinics was poor. This expectation of people's voluntary response to a clinic-based approach shows of course a sheer immaturity of official understanding and perception of the reality. This in turn led to a rethinking about the efficacy of clinic-oriented approach.

The Third Five- Year Plan (1961-66) document again expressed serious concern about an increasing growth rate of population, which had by then reached about 2 % per annum. During the Third Five Year Plan, family planning was declared 'as the very center of planned development'. The emphasis was shifted from purely 'clinic- based' approach to the more vigorous 'extension education approach' for motivating the people for acceptance of the 'small family norms'. A full-fledged Department of Family Planning was created in the Ministry of Health. During the years 1966-69, the programme took firmer roots which was described as the 'King pin' of the plan was made time-bound and target oriented with vastly increased funds. The family planning infrastructure (Example, Primary health centers, sub-centers, urban family planning centers, District and State Bureau) was strengthened. During the fourth plan, (1969-74), the Government of India gave top priority to the programme. The programme was made an integral part of MCH activities of primary health centers and their sub-centers. In 1970, an All India Hospital Post Partum Programme and in 1972, the Medical Termination of Pregnancy (MTP) were introduced. It was only during the Fourth Five Year plan that the proportion of outlays on Family Planning programme reached the maximum (about 1.8 %) ever recorded so far.

During the fifth plan, there was a shift from the clinical approach to control birth rate to a policy of an integrated health, family planning, nutrition and child care with a view to encouraging small family norms with healthy babies. The aim was to reduce birth from around 40 per thousand to about 25 per thousand. Apart from motivational programmes to be spread through publicity media, financial incentives were provided to induce the people for voluntary sterilization.

During the Fifth Five Year Plan (1975-80), there have been major changes. In April 1976, the country framed its "National population Policy". The disastrous forcible sterilization campaign of 1976 led to the congress defeat in the 1977 election. In June 1977, the new (Janatha) Government that came into power formulated a new population policy, ruling out compulsion and coercion for all times to come. The Ministry of Family Planning was renamed "Family Welfare".

Although the performance of the programme was low during 1977-78, it was a good year in as much as the programme moved into new healthier directions. The 42nd amendment of the constitution has made 'population control and Family Planning' a concurrent subject, effective from January 1977. The acceptance of the programme is now purely on voluntary basis. The launching of the Rural Health Scheme in 1977 and the involvement of the local people in the family welfare programme at the grass root level were aimed at accelerating the pace of progress of the programme. India was a signatory to the Alma-Ata declaration in 1978. The acceptance of the primary health care approach to the achievement of HFA/2000 AD led to the formulation of a National Health Policy in 1982. The National Health Policy was approved by parliament in 1983. It has laid down the long term demographic goal of NRR=1 by the year 2000 which implies a two child norm- through the attainment of a birth rate of 9 per thousand population and a couple protection rate of 60 per cent by the year 2000. The sixth and seventh Five Year Plan were accordingly set to achieve these goals

The sixth Five Year Plan projected it as people's programme, with the objectives of (i) reducing average size of the family from 4 children to two (2)

reducing birth rate from 36 per thousand to 21 per thousand. The seventh plan sought to achieve (1) a birth rate of 29 per thousand, (2) strengthening of maternal and childcare services and (3) expansion of facilities for care of pregnant women and nursing mother of the newborn babies. It assumed a crucial role for non- governmental agencies and voluntary services in propagating family planning and welfare services.

Eighth plan had revised the goals and eventually reconciled itself to a target period of 2011-16 for reaching net reproductive rate of unity. Controlling population growth was one of the six major objectives of the eighth plan. Recognizing the fact that reduction in infant and child mortality is an essential pre-requisite for acceptance of small family norm. Government of India has attempted to integrate MCH and family planning as part of family welfare services at all levels. National Development Committee approved Gadgil Mukherjee Formula which for the first time gave equal weightage to performance to MCH sector (IMR reduction) and family planning sector (crude birth rate reduction) as a part of basis for computing central assistance to non special category States.

In order to give a new thrust and dynamism to the ongoing family welfare programme the National Development Council set up a sub-committee on population to consider the problem of population stabilization and come up with recommendations to improve performance. The committee recommended that there should be (1) decentralized area specific planning based on the need assessment (2) emphasis on improved access and quality of services to women and children (3) providing special assistance to poorly performing States/districts to minimize the inter and intra state difference in performance

and (4) creation of district level data based on quality and coverage and impact indicators for monitoring the programme.

The Child Survival and Safe Motherhood programme (CSSM) was initiated in 1992. Under the programme, efforts were made to provide integrated ante natal, intra natal and post natal care to women; the child health care component included immunization, diarrhea and acute respiratory infection prevention and management programme. The pulse polio initiative aimed at eradication of polio by 2000 AD was initiated in 1996.

In response to the recommendation of the National Development Committee, there should be decentralized area specific need assessment and micro planning to meet the local needs. The Department abolished the centrally defined method specific targets for family planning in two States (Tamil Nadu and Kerala) and 18 districts in 1995-96. Encouraged by the response in these two States, department of family welfare has abolished the method specific centrally defined targets through out the country and changed over to primary health center based community need assessment, planning and implementation of family welfare programme. Efforts are made to improve access and quality of care to women and children.

International Conference on Population and Development (ICPD) was held in Cairo in 1994. It was strongly felt at the Cairo conference that population policies, which are dominated by macro demographic considerations, and acceptor target, driven programmes, are unnecessarily and unevenly burdening women with the task of regulating reproduction to meet the macro goals. It was argued that hence forth population policies should be guided primarily by the

considerations of reproductive health, reproductive rights and gender equality, rather than solely by the concern of fertility regulation as hither to practice. Following the Cairo conference deliberations and programme of action, the Government of India adopted the so called (RCH) approach to family planning and population stabilization and the method specific and acceptor based family planning targets were abolished in the country as a whole since April 1996.

The State Governments have been given the freedom to provide incentives to districts or lower level bodies or NGOs with the goal of improving the quality of services. In February 2000, the draft statement on National population policy of 1996 was finally modified and ratified by parliament announcing a new National Population Policy 2000.

There are several concerns however with the newly introduced reproductive and childcare approach. First, since this package of programme under RCH requires much enlarged budget, 'the emphasis on contraceptive services will get diluted when budgets are not adequately increased to cover the wider goals of RCH programmes. Secondly, there is a substantial likelihood that the abolition of targets will adversely affect, at least initially the family planning performance. The critical question is whether the new approach and programme will successfully lead the grass roots workers to undertake a 'real needs assessment' in consultation with the communities, they are to serve with an eventual development of plans and operational strategies.

The tenth plan proposes to fully meet all the felt needs for family welfare services and enable families to achieve their reproductive goals with a paradigm shift from:

❖ Demographic targets to focus on enabling the couples to achieve their reproductive goals.

❖ Method specific targets to meeting all the unmet needs for contraception to reduce unwanted pregnancies.

❖ Numerous vertical programmes for family planning and maternal and child health to integrated health care for women and children.

❖ Centrally defined targets to community need assessment and decentralized area specific micro planning and implementation of RCH programme to reduce IMR and reduce high desired fertility.

❖ Predominantly women entered programme to meeting the health care needs of the family with emphasis on involvement of men in planned parenthood.

(C) Achievement of family welfare programme in Kerala

For the effective and efficient implementation of family welfare programme, the State Family Welfare Bureau with the Director of Health Services (MCH) as the Controlling Officer, Additional Director of Health Services (FW) as the programme officer function at the Directorate besides a special cell formed at the secretariat exclusively for monitoring the programmes. At the State level, the programmes were organized by the family welfare Bureau and at District level, the District family Welfare Bureau. Family planning programme in Kerala is being implemented through a net work of primary health centers, community health centers and sub-centers. As on 2002 March 31st, 943 primary health centers, 105 community health centers and 5094 sub-centers are functioning in Kerala for the proper implementation of family welfare programme. Presently, family welfare programme are implemented on the basis of Community Need Assessment Approach.

Comparative statement of achievement of sterilization up to 3/2001 and 3/2002 is 151043 and 149803 respectively and the percentage of decrease in achievement was 0.8 compared to last year. Among all the districts, the performance of eight districts is satisfactory and Idukki stands first with 18.5% and Trivandrum stands last with 0.3 % of increase. The performance of Alappuzha, Kottayam, Thrissur, Malappuram, Kozhikode, and Kannur are very poor.

(D) Technique wise achievement

The total achievement under PPS up to March 2001 is 121832 and up to March 2002 is 122365 which shows an increase of 0.4% in achievement compared to the last year. The percentage of increase varies from 2.2 % of Ernakulam to 25.4% of Idukki. The districts of Trivandrum, Alappuzha, Kottayam, Thrissur, Malappuram, Kozikode, Kannur and Kasarkode are very poor. The achievement of Minilap up to the month of March 2001 is 27666 and that of March 2002 is 26301. It shows a decrease of 4.3% compared to last year. Kasarkode district has got 19.5% increase while the achievement of Kottayam district decreased to 43.3%. The total number of vasectomy reported up to March 2001 and March 2002 is 1545 and 1137 respectively. As a whole 26 % decrease shows in present year achievement from last year.

3.5.2. Spacing Method

The achievement of IUD insertion shows a decrease of 7.8 % of this year from last year. Better performance has been done by the districts of Ernakulam (19.5%) and Alappuzha (9.8%). But the performance of Trivandrum, Kottayam,

97

Idukki, Thrissur, Palakkad, Malappuram, Kozhikode, Kannur and Kasarkode are very poor. With regard to OP users, there is a decrease of 12.9% in this year achievement when compared to last year. Kottayam district has got poor achievement with 31.3 % decrease from that of last year. The district of Pathanamthitta has got an achievement with 58.2 % increase. Number of CC users showed a decrease of 13.2 % in achievement during the year 2001-02. The district of Trivandrum, Kollam, Kottayam, Idukki, Thrissur, Palakkad, Malappuram, Kozhikode, Wynad and Kannur showed decrease in achievement while other district showed increase.

3.6. Promotive Measures

The health status of a population is governed by such factors as water supply and environmental sanitation. Lack of protected water supply and sanitary conditions are conducive to the prevalence of such diseases as air-borne diseases, water-borne diseases which dominate in the morbidity pattern in the less developed countries. The historical experience of the developed countries as well as the nature and causes of the dominant disease group in today's developing countries have led to a general consensus that any improvement in general health standards would hinge more on promotive service such as environmental sanitation and water supply than on curative services.

Environmental degradation is considered to be the major cause of illness. Environment may be defined as an aggregate of all the external conditions and influences affecting the life and development of an organism. The provision of protected water supply and sanitation must, therefore, be the prime target of any programme to create a physical environment that is promotive of health

particularly in rural areas. When environmental conditions are very poor, incidence of infectious diseases will be very high. Inadequate water supply and extremely poor sewage facilities are the close correlates of low levels of health. There is enough evidence in the history of sanitation that proper maintenance of the environment was an attitude developed in India by our fore fathers from time immemorial. Innumerable references have been quoted in our epics; Ramayana and Mahabharata how our ancient saints and Men of wisdom made earnest attempts to preserve the purity of water and prevent the pollution of soil and air. At the time when Alexander the great invaded India, sanitation was at its highest peak. Koutilya's Arthasasthra mentions how the rulers in those days were interested to plan cities, dispose of rubbish and garbage, cremate the mortal remains in a safe manner and lastly prevent nuisance. Again, in Buddhist literature, references regarding the selection of proper site for schools, construction of roads, soakage pits and sanitary conveniences, disposal of waste and sullage are seen in plenty. Though we can boast of this rich heritage in the past, the current sanitation practice is at its lowest level. Rivers, tanks, wells and soils are constantly polluted. Open grounds are used for defecation purposes, fumes and gases are released into the atmosphere. Mosquitoes and flies swarm all over. In the recent past, radio-active fallouts have made our life more dangerous. Protected water supply is denied to a very large section of the community. An equally large number of houses have no latrines. Diseases which ought to have been eliminated long ago as cholera, dysentery, endemic group of fevers, worms, malaria and filaria are appeared in this land. Analysis of promotive measures in this study is restricted to the provision of drinking water and sanitation only.

Safe drinking water and improved sanitation play a major role in the overall well being of the people, with a significant bearing on infant mortality rate, death rate, longevity and productivity. Much of the ill health which affects humanity, especially in the developing countries can be traced to lack of safe and wholesome water supply. There can be no state of positive health and well being with out safe water. Water is not only a vital environmental factor to all forms of life, but it has also a great role to play in the socio economic development of human population. In 1981, the 34th World Health Assembly in a resolution emphasized that 'Primary health care' which is the key to the attainment of 'Health For All by the year 2000 AD'. Water is also integrated with other primary health care components because it is an essential part of health education, food and nutrition and also Maternal and Child Health.

The poor, both in rural and urban areas, bear a disproportionately higher burden on the non-availability of water, as well as its poor quality. Seasonal disruption of water supply is common, especially during summer months. Fetching of water for domestic use, sometimes from far flung sources, is a time consuming physical burden borne by women, particularly in the rural areas. Apart from repercussions on the health, this also affects their overall well being. Moreover, 70-80 % of illness is related to water contamination and poor sanitation. Women and children are particularly vulnerable to the effects of contamination. It is also a matter of concern that despite the progress achieved in provision of water supply, the level of water-related sickness continues to be high. While water supply and sanitation facilities are important components of the overall strategy for development, social issues such as primary health care, women's welfare, child nutrition, are equally significant and inter-linked, thus

necessitating a convergence of approach in implementation of these programmes.

Improvement such as the environmental sanitation got the attention of planning authority from 1950 itself. In the first three five year plans, one third of the total sum allotted to health was earmarked for water supply and sanitation schemes. As a result, 11000 villages, primarily in areas where water born diseases were endemic, were provided with protected water supplies. Sewage and drainage facilities were not, however, provided simultaneously with fresh water supplies. As a result, sanitary conditions actually deteriorated. Inadequate maintenance of newly constructed water and sewage system also created further health hazards. In 1980, there were 2.31 lakh problem villages in India. The 6th plan target was to cover all problem villages with at least one source of water supply. By the end of 6th plan, except 39000 problem villages, all of them have been provided with water supply facilities. This would mean that a total of 299 million rural populations were covered under water supply. The objective in the 7th plan was to cover all these villages which do not have assured source of water supply within a distance of 0.5 Km. It has been targeted to cover 39000 problem villages to achieve the decaded target of 100 percentage coverage of the rural population.

The provision of potable drinking water to all villages has been identified as one of the priority tasks of Government. During the ninth plan, 72859 Not Covered (NC) and 3,52,43 Partially Covered (PC) habitations have been covered with water supply facilities. As of January 28, 2003, there are 12,95,504 Fully Covered (FC) habitations, 11,27,804 Partially Covered (PC) with a balance of 14,356 habitations as non-Covered (NC) ones. The tenth plan

envisages the provision of potable drinking water to every settlement in the country on a sustainable basis and the pursuit of all possible measures for the rapid expansion and improvement of sanitation facilities in rural and urban areas.

The department of drinking water supply under Ministry of Rural Development has been mandated to provide safe drinking water in all rural habitations, by April 2004. To achieve this objective, the programmes like the Accelerated Rural water Supply Programme (ARWSP), the Pradhan Manthri Gramodaya Yojana- Rural Drinking Water (PMGY-RDW) are being implemented. Considerable success has been achieved in meeting the drinking water needs of the rural population. With an investment of over 34000 crore, 91.06% of rural habitation have been fully covered (FC) with drinking water facilities and 7.93 % are partially covered (PC) (Economic survey, 2002-03).

The accelerated Rural Water Supply Programme (ARWSP), currently implemented through the Rajiv Gandhi National drinking Water mission in the Department of Drinking Water Supply has been in operation since 1972-73 to assist the States to accelerate the pace of coverage of drinking water supply facilities to the rural population. The programme focuses on the coverage of all rural habitations specially the un-reached ones, to ensure sustainability of the systems and sources to tackle the problems of water quality and institutionalize water quality monitoring and surveillance through a catchment area approach. Necessary reforms have been introduced in 1999 so as to gradually replace the government oriented, centralized and supply driven programmes by a people oriented decentralized demand driven and community based ones.

As per census of India, if a household had access to drinking water supplied from a tap or a hand pump/ tube wells situated with in or out side the premises, it is considered as having access to safe drinking water. Millions of people in the country suffer from water borne diseases on account of lack of access to safe drinking water. It is the poor who suffer from higher prevalence of disease as compared to the rich. Studies undertaken in many metropolitan cities show a higher rate of diseases and longer duration per illness due to poor quality · of drinking water supply in the slum areas. In 1991, census reported nearly 62 % of households in India as having access to safe drinking water as compared to about 38 % in 1981. Over 81 % of urban households and around 56 % of rural households had access to safe drinking water in 1991. The corresponding figures for 1981 were 75 % and 27 % respectively. The 54th Round of National Sample Survey (July 1999) on drinking water, sanitation and hygiene estimated that 50% of rural households were served by a tube well/hand pump, 26 % by a well, and 19 % by taps. There is widespread inter-state difference, though these differences have declined in the eighties, both in rural and urban areas. The rural urban gap has also declined by nearly half in 1991. Among major States, the situation is worst in Kerala, where less than one fifth of house holds had access to safe drinking water (Table 3.3). Much of Kerala's drinking water requirements are met from wells, which is not considered a safe source of drinking water. Perhaps there is a case for looking at the high morbidity levels in Kerala in this context (Human Development: India 2002).

Kerala Scenario

Water supply and sanitation is a major area of development concern not only in the State plan but also in the development agenda of local self-

government institutions. With planned development effort, Kerala could provide protected drinking water to 62.67 %of the population. Though the proportion of population in the State with access to protected water supply has been increasing, still a substantial portion remains to be covered. As on 10/2001 the rural population covered stood at 124 lakhs. In addition, 14 lakh rural population partially benefited by spot sources.

Table 3.3.

Status of Coverage of Habitations under Rural Water Supply

States	Percentage distribution			
	NC	PC	FC	TOTAL
Andra Pradesh	0.00	19.85	80.15	100.00
Assam	0.62	24.88	74.49	100.00
Bihar	0.00	0.00	100.00	100.00
Gujarat	0.71	4.72	95.12	100.00
Haryana	0.00	0.71	99.29	100.00
Himachal Pradesh	1.81	20.45	77.74	100.00
Karnataka	0.00	31.46	68.54	100.00
Kerala	8.01	70.46	21.53	100.00
Madhya Pradesh	0.00	0.00	100.00	100.00
Maharashtra	2.33	27.95	69.72	100.00
Orissa	0.00	0.00	100.00	100.00
Punjab	10.36	15.72	73.92	100.00
Rajasthan	5.99	2.68	91.32	100.00
Tamil Nadu	0.00	0.00	100.00	100.00
West Bengal	0.00	11.46	88.50	100.00

Source: Economic Survey India: 2002-03 Government of India

NC: Not Covered; PC: Partially Covered; FC: Fully Covered.

Table 3.4

Access to Safe Drinking Water in Households in India.

States	1981	1991
Andra Pradesh	25.89	55.08
Assam	-	45.86
Bihar	37.77	56.76
Gujarat	52.41	69.78
Karnataka	33.87	71.68
Kerala	12.20	38.68
Madya Pradesh	20.17	79.45
Maharashtra	42.29	90.50
Orissa	14.58	62.83
Punjab	84	92
Rajasthan	27.14	58.16
TamilNadu	43	74.11
West Bengal	69.6	81.9

Source: Housing and Amenities Paper 2 of 1992, Census of India 1991.

As on 31-12 2001, 1609 problem villages were partially covered with protected water supply benefiting a population of 118.4 lakhs. During the period 1992-2002 the coverage increased by 43.1 percentage. The percentage of urban and rural population covered by piped water supply is around 78.5 % and 57 % respectively. In Thrissur District 247 villages were covered with a population of 14.56 lakhs, the largest coverage in Kerala. The relevant details are given below.

Table 3.5.

District-wise Details of Problem Villages Covered and Population

Benefited as on 31-12-2001

District	Partially Covered village	Population benefited
Trivandrum	101	1282009
Kollam	100	993258
Pathanamthitta	70	587013
Alappuzha	83	802713
Kottayam	95	712432
Idukki	77	442283
Ernakulam	119	1203076
Thrissur	247	1456654
Palakkad	183	1022225
Malappuram	146	1360237
Kozhikode	99	516403
Wayanad	68	418205
Kannur	79	470881
Kasarkode	142	581039

Source: Kerala Economic Review, 2002

3.7. Sanitation: Access to Toilet Facilities

The Dictionary meaning of the word sanitation is "the science of safeguarding health". One of the best definitions is that given by National Sanitation Foundation of the USA, which is as follows. "Sanitation is a way of life. It is the quality of living that is expressed in the clean home, clean farm, clean business, clean neighborhood, and the clean community."

In the past, sanitation was centered on the sanitary disposal of human excreta. In actual fact, the term sanitation covers the whole field of controlling the environment with a view to prevent disease and promote health. 'Sanitation' in the present study is restricted to access to toilet facilities.

A majority of India's population does not have access to toilet facilities in their dwellings and lacks sanitation facilities for the disposal of wastewater. Apart from the availability of safe drinking water, lack of sanitation, particularly sewage and disposal of solid waste has been observed as among the main reasons for prevailing ill health and morbidity levels in the country. As per the 1991 census, less than one fourth of the households in the country had toilet facility with in the premises of their residence; the proportion was less than 10 % for rural households and around 64 % for urban households.

There is significant variation in access to toilet facilities among States. Among the major States, at one end in Kerala, 51 % of the households had access to toilet facilities and at the other end; it was less than 10 % in case of Orissa. For the most populous States in the country including Bihar, UP, MP and Rajasthan the proportion was well below 20 %. Even in the relatively developed States like Gujarat and Maharashtra, the proportion of households with access to toilet facility was around 30 %. In all States, the proportion was significantly lower for households in rural areas in comparison to urban areas.

National Family Health Survey 2 also provides data on access to toilet facilities. As per the survey, 64 % of the households in the country had no access to toilet facilities in 1998-99 in comparison to 76 % in 1991 reported by

the census. Less than one- fifth of rural households and over four fifth of urban households had access to such facilities. At the State level, the data indicates that the proportion of households having access to toilet facilities in larger, populated and poorer States was much lower than the national average. Incase of Kerala, the proportion of households with access to toilet facilities of 85 % was much above the national average of 36 %.

The problem of sanitation for the majority, at household level, is essentially of awareness and education and not really of resources. The resources, technology and management aspects of the problem are important, more in the context of urban sanitation and solid waste management. Many cities and small towns generate more solid waste than they can possibly collect or dispose under present institutional arrangements. A major problem in urban solid waste management relates to sewage disposal. With a large number of towns without sewage system and inadequate and often mal functioning system in some other, the threat to the availability of safe drinking water is quite serious in most urban areas in the country.

Rural Sanitation

The central government supplements the efforts of the States in the field of rural sanitation under the central Rural Sanitation Programme (CRSP). This programme was restructured in 1999 and Total Sanitation Campaign (TSC) introduced. The TSC envisages a synergised interaction between the government, people and active NGO participation. The revised tenth Five-year plan strategy envisages a shift from allocation-based programme to a demand based project mode. Out of the total out lay of Rs. 2,032 crore, the central

Government share is Rs. 1,225 crore, share of the State Government is Rs. 427 crore while the beneficiary share is Rs 380 crore. The coverage of rural population with sanitation facilities was estimated to be about 17 % at the beginning of the ninth plan and has increased to 20 % as on 1-4-2002 (Economic Survey, 2002-2003)

Kerala Scenario

Of late, there is a growing realization that the much talked about Kerala model of health carries a high morbidity load. It can be argued that when life expectancy increases there can be a corresponding increase in morbidity. However water and sanitation related diseases still feature prominently in the morbidity syndrome prevalent in the State. One of the factors that have contributed to this is Kerala's high density of population. Lack of basic amenities compels people to resort to practices such as open-air defecation. The matter has been further aggravated by acute poverty, poor hygienic and inadequate garbage disposal and drainage.

The estimate of "The task Force on rural Sanitation in Kerala" is that new families without latrine grows at the rate of 1.5 % per year which is slightly higher than the rate of 1.4 % at which new sanitary latrines were constructed. The Development reports of the Grama Panchayats, which they prepared for the people's campaign for the ninth plan, reveal that inadequacy of sanitation coverage is an acute problem for women in particular, especially for those living in the coastal areas where settlement is high and public space scarce and in colonies inhabited by the poor.

Kerala has the highest coverage of individual household latrines in India. In the ninth plan about 300 Grama Panchayats gave top priority to sanitation and achieved the goal of more than 95 % coverage of the household sanitary latrines. During the ninth plan about 4.32 lakh sanitary latrines were constructed under decentralized plan campaign, which is much more than what was achieved in the past 15 years through different Government programmes.

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CHAPTER 4

HEALTH SCENARIO OF KERALA

Kerala, a small state in India comprising 1.2 % of country's total area and around 3 % of its population, located at the southern tip of the Indian sub continent, situated between the Arabian Sea and the Western Ghats, had attracted worldwide attention for its remarkable achievements in social development indicators in spite of its economic backwardness. Kerala was known to the ancient Chinese, Greeks and others even before Christ. In1957, it attracted the attention of the world when it elected a communist government to power through the ballot box. One particular aspect of Kerala experience that has caught the attention of development scholars is its social indicators of development like death rate, birth rate, infant mortality rate, literacy rate, population growth and so on. Kerala is the only state in India that has been declared fully literate. Uttar Pradesh, India's largest state with a population of nearly 150 million remains the least literate with an adult literacy rate of about 40% (Sen 1997). Kerala also has the lowest infant mortality and highest life expectancy rate of all the Indian states. Kerala's social development indicators are even comparable to that of highly advanced countries than to the rest of India or to its counter parts in the low-income world.

Kerala remains at the top of the National Human Development Report (NHDR) table with a HDI of 0.638 in 2001. Corresponding figure for all India rate is 0.472. Though Punjab ranks top in per capita income terms, it remains 2nd in HDI with an HDI of 0.537 in 2001. The National index for the rural areas between 1981 and 1991 has gone up from 0.263 to 0.340 and for urban areas

from 0.442 to 0.511. The rural urban gap was minimum in case of Kerala and maximum for Madya Pradesh in the early nineties (Table 4.1).

Table 4.1.

Human Development Index 1981, 1991 and 2001 for Major State

STATE / Country	1981		1991		2001	
	Value	Rank	Value	Rank	Value	Rank
India	0.302		0.381		0.472	
Andra Pradesh	0.298	23	0.377	23	0.416	10
Assam	0.272	26	0.348	26	0.386	14
Bihar	0.237	32	0.308	32	0.367	15
Haryana	0.360	15	0.443	16	0.509	5
Karnaka	0.346	16	0.412	19	0.478	7
Kerala	0.500	2	0.591	3	0.638	1
Madyapradesh	0.245	30	0.328	30	0.394	12
Maharashtra	0.363	13	0.452	15	0.523	4
Orissa	0.267	27	0.345	28	0.404	11
Rajasthan	0.256	28	0.347	27	0.424	9
Tamilnadu	0.343	17	0.466	14	0.531	3
Uttar Pradesh	0.255	29	0.314	31	0.388	13
West Bengal	0.305	22	0.404	20	0.472	8

Source: HDR 2001 Government of India, Planning commission

All these distinguish Kerala not only from the rest of India but even from a large number of developing countries. Kerala finds her place along with such widely varying, geographically and socio politically, countries such as China, Cuba, Costa Rica and Sri Lanka. The advances Kerala has made in terms of basic indicators of health status include not merely low birth and death rates and high life expectancy for the population as a whole; these general achievements should be noted along with a number of other dimensions and indicators. These may be summarised as low birth and death rates along with higher female sex ratio and higher female life expectancy, low infant mortality rate with a reduced gap between rural and urban and lower rate of disability.

4.1. Prevailing Explanatory Theories

There are several explanatory hypotheses which explain the reasons behind the remarkable progress achieved in Kerala in social development in spite of its economic backwardness. Nair (1974) first suggested that the extension of primary health centers and public health measures in the state led to decline in infant mortality and child mortality rate in the 1950s and subsequently to fertility decline in 1960s. On the other hand, Paniker (1999) pointed out that mortality rates had already declined substantially prior to 1980s and proposed that public health measures such as sanitation introduced by the rulers of Travancore and Cochin in the 19th and 20th centuries were the key to reduced mortality. He argued that the relative contribution of modern health facilities was small. An all encompassing hypothesis was provided by Ratcliff (1977) who saw change in Kerala's demography as the result of broader socio economic and political developments. First, he pointed out that state's pursuit of land reforms to achieve more equitable distribution despite low average income in contrast to the rest of India. In addition, he proposed that availability of wage employment and high wage rate helped landless agricultural labourers as well as workers in the industrial and service sectors. In sum, a greater proportion of labour force participated actively and productively in the economy – and therefore shared in the over all distribution of income, despite high rates of unemployment.

Secondly, he extolled Kerala's education policies, which emphasised primary education, and made education expenditure in accordance with this priority. As a result, primary education was almost universal. Education of women and of lower castes was a key factor enhancing their status and social

115

mobility. The education of women was also associated with a higher age at marriage among women in Kerala compared with the rest of India.

4.2. Health Transition in Kerala

After the 73rd and 74th amendments to the constitution, the Kerala Government has handed over the administration of public health centers and community health centers to the Grama panchayat and Block panchayat, thus increasing the potential for people's direct participation and involvement. Simultaneously, initiation of the people's plan campaign has opened up new possibilities for local initiation. At the same time, concurrent with the new economic policy of liberalisation there has taken place a sharp rise in private medical expenditure (Kunnikannan and Aravindan, 2000). Rise in drug prices, changes in prescription pattern, over use and misuse of medical technologies by the medical providers etc, have all contributed to the increase. In this background, this chapter examines the health attainments of Kerala for a period between 1911 and 2001 and compares its status with other states and other nations and focus to new dimensions of health and the neglected aspects which need attention. Thus an attempt is made here to find out the problems and prospects in this sector in Kerala. Following Krishnan (1991), four indicators are used here to represent the out comes of health and demographic transition in Kerala; viz death rate, birth rate, infant mortality rate, and life expectancy at birth. A brief analysis on morbidity transition is discussed in the next chapter since in terms of morbidity; Kerala leaves much to be desired when compared to the other health indices.

4.3. Mortality Transition

Kerala's health conditions are the best among the various states in India. (Oommen, 1999). Kerala consistently had lower levels of mortality than that of India as a whole even from the beginning of the 20th century (Table 4.2). The death rate in Kerala has declined by 83 % between 1911-20 and 1987-89. At the all India level death rate declined by 77 % for the same period. Though the difference in the crude death rate between Kerala and all India was insignificant during 1931-40, the death rate in Kerala had declined to half the all India rate by 1972. It can be seen that in respect of death rate all India remains three decades behind Kerala. Since 1991, death rate in Kerala started rising from a low level of 5.8 to 6.4 in 2000 i.e. the status attained in the beginning of 1980s. The difference between all India rate and Kerala rate became narrower since 1991.

It was surprising to note that Kerala had outstripped not only other states but also the highly advanced countries like UK, USA, Switzerland etc (Table 4.3 and 4.4) in terms of general mortality indicators. For a clearer understanding of the factors responsible for such a dramatic decline it is helpful to analyse the regional differences and changes with in Kerala itself. Present Kerala state was constituted integrating Malabar district with Travancore Cochin state in November 1956. Since Malabar had been under the direct rule of British for a long time, the education and health indicators here was comparable to the rest of India in the mid 1950s. Therefore, Malabar significantly lagged behind Travancore Cochin (which had never been directly ruled by the British.) in literacy level and in access to health care.

Table 4.2.

Trend in Death Rate Kerala and India (per thousand)

Years	Kerala	India
1911-20	37	47
1921-30	32	36
1931-40	29	31
1941-50	18	27
1951-60	16	23
1961-70	11	18
1971-80	7.3	13.9
1981-85	6.6	12.1
1985-89	6.2	11.3
1990	6.1	14.2
1991	5.8	10
1992	6.3	10.1
1993	6.0	9.3
1994	6.1	9.3
1995	6.0	9
1996	6.2	9
1997	6.2	8.9
1998	6.4	9
1999	6.4	9
2000	6.4	8.5
2002	6.4	8.4

Source; 1911-1990; Sen and Dreeze
1991-98, Economic review 2000 Kerala
Economic Survey Govt. of India Various issues

The history of social development since the formation of Kerala state was really a story of how these differentials were eliminated or narrowed and the policies and programmes that were adopted for this purpose was extension of policies and programmes followed earlier in Travancore and Cochin to Malabar region. This was a combination of public and private investment in education and health, and provision of financial incentives for the private sector to establish and operate educational institutions. The private sector has also played a major role in health care delivery, especially since 1975, but there were no financial or other incentives in this case. A larger share of investment in education and health was

earmarked for the Malabar region, so that over the past years, disparities in the number of public institutions between the two regions narrowed. The result of these developments in the building up of social infrastructure was that literacy and infant mortality rate in Travancore Cochin Malabar have now converged. Kerala demonstrated that a comparatively high level of social development can be achieved within a single generation and a deliberate and targeted social policy can indeed lead to significant improvements in levels of human development even in situations where per capita income is low.

Table 4.3.

Trend in Death Rate Inter State Comparison

Country/ State	1971-73	1981-83	1991	1994	1995	1996	2000
India	10.9	12.1	10.8	9.3	9	9	8.5
Andra Pradesh	15.8	10.7	9.7	8.3	8.4	8.4	8.2
Assam	17.3	12.4	1.5	9.2	9.6	9.6	9.6
Bihar	15.7	13.7	9.8	10.4	10.5	10.5	8.8
Gujarat	15.7	11.8	8.5	8.7	7.6	7.6	7.5
Haryana	11.3	9.8	8.2	8.1	8.1	8.1	7.5
Karnataka	12.4	9.2	9	8.3	7.6	7.6	7.8
Kerala	8.9	6.6	6	6.1	6	6.2	6.4
Madya Pradesh	17.1	15.4	13.8	11.6	11.2	11.1	10.3
Maharashtra	12.9	9.2	8.2	7.5	7.5	7.4	7.5
Orissa	17.9	12.9	12.7	11.2	10.8	10.8	10.5
Punjab	11.7	9.1	8	7.6	7.3	7.4	7.4
Rajastan	16.2	13.3	9.8	9	9.1	9.1	8.5
Tamil Nadu	14.5	11.6	8.8	8	8	8	7.9
UttarPradesh	21.7	15.7	11.1	11	10.3	10.3	10.3
West bengal	NA	10.6	8.1	8.3	7.9	7.8	7

Source: 1971-73 &1981-83 P.G.K. Panikar
Economic Survey, Various Issues

Table 4.4

Trend in Death Rate International Comparison

Country	1970-75	1990-95
UK	12	12
USA	9	9
Japan	7	8
Belgium	12	12
Sweden	10	12
France	11	10
Switzerland	9	10

Source: World Development Report, 1999

4.4. Infant Mortality Rate

Infant mortality rate is considered as an index which measures the quality of life in any given population and it is considered a more reliable index of the level of nutrition and health and it is lowest in Kerala when compared to other states whether it is for rural or urban. Of all changes in demographic sphere that have occurred in Kerala, the decline in IMR is most remarkable. Reviewing IMR from 1911 to 2001, it is found that IMR which stood at 242 per 1000 live birth have been reduced to 66 in 1961-70 and to 37 in 1981 and 16 in 1991 and 2001 and 11 in 2002 (SRS). From 1911 to 1970, IMR in Kerala has declined by 73 % as against the all India rate of 58 %. Between 1970 and 1980, it registered a 43 % decline though all India rate remained at 114 both in 1970 and 1980. There is a sharp decline in IMR from 66 to 16 from 1970 to 1991, a decline of 75 %. By contrast, all India rate declined from 114 to 80 during the same period, showing only 30 % decline. Between 1980 and 1990, IMR value declined to 16 from 40 showing again 6 % decline as against the 30 % decline of all India rate. In 1990s IMR in Kerala did not register much decline and from 1998 it again started rising to reach a level of 16; a level, i.e. attained in 1991. As against this, all India rate showed a decline of 9 points from 1991 to 2001.

Table 4.5.

Infant Mortality Rate Kerala and India

Years	Kerala	India
1911-20	242	278
1921- 30	210	228
1931-40	173	207
1941-51	153	192
1951-60	120	140
1961-70	66	114
1971	58	19
1980	40	114
1981	37	110
1985	31	97
1990	17	80
1991	16	80
1992	17	80
1993	13	74
1994	16	74
1995	15	74
1996	14	72
1997	12	71
1998	5.6	71.6
1999	16.3	65.8
2001	16	71.0

Source: Sen and Dreeze, 1996;
  Economic Review, Government of Kerala, Various issues;
  Economic survey, Government of India

IMR in Kerala in 1992 is 17 per 1000 in rural areas and 13 per 1000 in urban areas - put Kerala higher than the average for developing countries with high human development among whom the average rate of IMR was 31 per 1000 in 1991 (UNDP, 1993). The decline in IMR in Kerala has been associated with important improvements in pre- natal and post- natal health care and higher levels of institutional child birth. For groups of people among whom there was immunisation, hospitalisation, and ante-natal and post-natal care, IMR of 6 to 7 per 1000 were achieved in Kerala (Sen and Dreeze, 1996).

121

4.5. Inter State Comparison

SRS provides annual series on indicators of morbidity and fertility. The annual series data on IMR for the major states provided by SRS from 1971 to 2001 is presented in Table 4.6.

Table 4.6.

Trend in IMR Inter State Comparison

COUNTRY/ STATE	1971-73	1981-83	1991	1994	1995	1996	2001
India	140	110	80	80	74	72	71
Andra Pradesh	123	86	73	73	67	65	66
Assam	144	106	81	81	77	74	78
Bihar	na	118	69	69	73	71	67
Gujarat	154	116	69	69	62	61	64
Haryana	114	101	68	68	69	68	69
Karnataka	80	69	17	77	62	53	58
Kerala	54	37	77	17	15	14	16
Madya Pradesh	151	142	222	222	99	97	97
Maharashtra	92	79	60	60	55	48	49
Orissa	149	135	126	126	103	96	98
Punjab	98	81	53	53	54	51	54
Rajastan	155	108	77	77	86	85	83
Tamil Nadu	112	91	57	57	54	53	53
UttarPradesh	198	150	93	93	86	85	85
West Bengal	na	91	70	70	58	55	53

Source: Sample Registration Survey

Another noteworthy feature of IMR of Kerala is the wide gap existing between Kerala and other States. Indian state closest to Kerala in 2001 is Punjab, Tamil Nadu and West Bengal with an IMR of 54, 51 and 53 respectively, more than three times of Kerala. Though in terms of per capita, they are far ahead of Kerala in terms of IMR, these states remain three decades behind Kerala.

122

Krishnan (1991) divides the post 1956 decline in IMR in Kerala in to three periods, first the decade after the formation of Kerala, i.e. 1956 to 1966, when according to Krishnan IMR appears to have declined by about 43 %. Second, 1966 to 1976, when the decline appears to have slowed down; and thirdly, from 1976 to 1988, when the decline again accelerated. Krishnan associated the changes in the first period with improvements in health care in Malabar and with great control of infectious diseases, with a leveling of the achievement of the first period, and the improvement in the third period was associated with improved ante-natal and post-natal care and more institutional child birth.

By the second half of the eighties, the pattern of IMR shifted away from the pattern of characteristics of less developed economies. Peri-natal mortality accounted for 67 % of all infant death. Death after the first four weeks are attributed to what is considered as exogenous; which can to a great extent than the death in the first four weeks, be controlled by appropriate medication.

The proportion of infant and children who were vaccinated was much higher in Kerala than in India. Immunization coverage improved substantially in eighties, and data point to a note worthy improvement in this respect in the last years of eighties. The survey of immunization in Kerala in 1989 and the 1991 survey in Ernakulam, Palghat, and Malappuram reported by Zacharia *et al.* (1992) indicate rate of immunization that were high; substantially higher than the rate recorded by NSS (1986-1987).

A note worthy feature of studies of immunization of children in Kerala was that income was not the major determinant of immunisation. From a study of

child health in an urban slum and a more prosperous middle class area in Trivandrum in 1987-88 (Soman, *et al.*, 1990) concluded that although morbidity load in the slum was greater, vaccine preventable diseases against which immunisation services were freely available did not pose a particular problem in either area. An all Kerala study conducted by the KSSP showed that incidence of vaccine preventable diseases was not significantly concentrated among families in low income and low asset categories. Clad Well and Cald Well (1985) identify girls schooling as the single most important influence on survival ship differentials. They also note that the historical records does not show examples of economic development leading to low mortality levels where low levels of female education continue. Mari Bhat and Irudaya Rajan (1990) identify female literacy as the 'single most' important factor explaining the demographic transition in Kerala. Paniker (1999), wrote that spread of education, especially among women in rural Kerala, was a crucial factor contributing to the high degree of awareness of health problems and fuller utilization of health facilities. A higher average age at marriage, higher rate of female employment in the organized sector, higher levels of health awareness and information among women, maternal utilization of the health system, and the greater decision making roles of women in Kerala household etc also played a major role. Of great importance also are social and cultural attitudes towards female survival, absence of parental discrimination in providing health care to boys and girls.

Though Kerala ranks top in inter state comparison of infant mortality rate and Punjab which stands second has a difference of 38 points from Kerala's IMR, its position is far behind when it comes to inter national comparison. In terms of adult mortality, Kerala out paced even the developed countries. The picture is disappointing in the international comparison of infant mortality rate (Table 4.7). It is seen that Kerala remains three decades back in terms of infant

mortality rate when compared to the high level achievers in the world. Again, in terms of still birth, and one week mortality the picture is not bright. Though ante–natal care visits among pregnant women before delivery are extremely high in Kerala, average birth weight is on declining. All these shows so many lacunas in the Maternal and Child health programmes which needs to be given due care.

Table 4.7.

IMR International Comparison

Country	Years	
	1970-75	1990-95
UK	17	8
USA	18	8
Japan	12	5
Belgium	19	8
Sweeden	10	6
France	10	7
Switzerland	13	7
Low income countries	80	-
Middle income countries	-	73
High income countries	-	7

Source: Health Information of India, 1997-98

4.6. Birth Rate

Kerala has made tremendous achievement in declining birth rate. The birth rate in Kerala declined by more than half from 37 in the year 1966 to 18 in the year 1991 per 1000 population (Table 4.8). Kerala has recorded the lowest decennial growth rate (13.9) among all the States in India. In fact, the districts wise population growth rate during this decade lend further support to the finding that in large parts of Kerala the birth rate has declined below the replacement level. During the period 1931-1960, the birth rate in Kerala

declined by 1.1 points but between 1951-1960 and 1961-70, it declined by 7.4 points. From 1961-70 to 1981, it recorded 6 points decline and from 1981 to 1991, a decline of 6.2 points. In 2000, it reached to a level of 17.9 registering a decline of 1.5 points.

At the all India level, birth rate declined from 36.3 (1970-73) to 29.5 (1991) i.e., by 18 % where as Kerala recorded 40 % decline over this period. The estimates of the crude birth rate of Kerala together with those of the major states of India from 1971 to 2001 are presented in Table 4.8. It may be noted that birth rate in Kerala is significantly lower than the corresponding rates in all the major states included in this table. Moreover, these rates in Kerala have registered a steady and steep decline over this period. Thus, we find that in respect of birth rate, all India remains three decades behind Kerala in 1991.

Table 4.8.

Estimated Live Birth Rate Kerala and India

Year	State	India
1931-40	40	45.2
1941-50	39.8	39.9
1951-60	38.9	41.7
1971-73	30.5	36.3
1981-83	25.6	33.8
1991	18.3	29.5
1992	17.7	29.2
1993	17.4	28.7
1994	17.3	28.6
1995	18	28.3
1996	18	27.5
1997	17.9	27.2
2000	17.9	25.8

Source: Sen and Dreeze, 1996;
    Economic Review, Government of Kerala, Various issues;
    Economic survey, Government of India

Kerala's low birth rate is associated with comparatively high rates of birth control. The CPR, which is the proportion of eligible couples that use long term or temporary methods of birth control, increased sharply in Kerala over the eighties. Official data indicate that CPR for the state rose from 36.8 % in 1981 to 60.9 % in 1990. According to the NSS, the all India CPR for rural areas was 24.95 in 1986-87, rural Kerala (43.61) ranked third after Delhi (51.87) and Maharashtra (44.5 %). The all India CPR for urban areas was 36.85; urban Kerala (48.47) ranked fourth after Delhi (52.7) Maharashtra (49.1) and Punjab (48.9). Low fertility rate in Kerala is also associated with a high age at marriage among women in Kerala than else where. The all India average which was 18.3 years in 1981 was substantially lower than the Kerala average 21.8 years. The average age of women at the time of first child birth is also higher in Kerala than any other State (Kannan *et al.,* 1991). Improved child health and higher education are among the most important reasons for Kerala's low and declining birth rate and the general acceptance of a small family norm. Cald Well and Cald Well (1985) concluded that Parental education has a greater influence than income on fertility.

4.7. Life Expectancy at Birth

One of the key indicators of Kerala's achievements is high life expectancy at birth. Life Expectancy at Birth (LEB) in Kerala is similar to the corresponding figures for developing countries classified as having achieved high human development in HDR 1993. A man in Kerala can expect to live to be 69 years or 10 years longer than the average Indian man and a woman in Kerala can expect to live 74 years or 15 years longer than the average Indian women. Table 4.9 shows that LEB for men and women in Kerala has been

higher than all India life expectancy since at least the second decade of the last century. In the post independence period in Kerala, there was a sharp increase in LEB in the sixties over the previous decade, and again in the eighties compared with the seventies. It has been so for the whole period covered by our data. The difference between Kerala and India was greater at the end point in the eighties. Lengthening of life expectancy at birth is a consequence of the decline in general and infant mortality rate. A higher expectation of life is often associated with better nutritional standards among the population, even if the two are not uniquely related. Table 4.9 presents data indicating the progress in this regard in Kerala and in India for a period of hundred. It is seen that life expectancy doubled in Kerala between the period 1921-30 and 1971. A comparison of life expectancy in Kerala with that of India as a whole shows that the difference has widened over this period. Another interesting feature is that Kerala has higher life expectancy for females than for males as in the developed industrial countries.

Table 4.9.

Life Expectancy at Birth, Kerala and India

Years	Males		Females	
	Kerala	India	Kerala	India
1911-20	25.5	22.6	27.4	23.3
1921-30	29.5	26.9	32.7	26.6
1951-61	44.3	35.5	45.3	35.7
1961-71	54.1	43.2	57.4	43.5
1971-81	60.6	49.8	62.6	49.3
1981-85	65.2	54.5	71.5	54.9
1986-88	67.5	56.0	73.00	56.5
1991-96	69	60.6	75	61.7
2001	72	64	75	67

Source: Sen and Dreeze, 1996;
Economic Review, Government of Kerala, Various issues;
Economic survey, Government of India

Fore going analysis reveals that in terms of survival norms Kerala made signal achievements in health status. Most analysts have seen Kerala's achievements in health as something of an enigma. Kerala achieved the health status as par with that of USA spending roughly $10 per capita while US spends about $3750 per capita per year on health care. Kerala's achievement in health in spite of its economic backwardness and very low health spending has prompted many analysts to talk about a unique "Kerala Model of Health", worth emulating by other developing parts of the world (Table 4.10).

Table 4.10.

Selected Indicators of USA and Kerala 1998

Items	USA	Kerala
Area(1000km square)	9500	39
Population (million)	260	30
Percapita availability of land (hectare)	3.6	0.13
Per capita income (US $)	25000	380
Per capita energy consumption	12000	<400
Life expectancy at birth	70	72
Crude death rate	8.8	6
Crude birth rate	15.9	17.9
Total fertility rate	2.1	1.8
Literacy rate	96	93

Source: Govindan Parayil (2000). Kerala Development Experience.

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CHAPTER 5

MORBIDITY TRANSITION IN RURAL KERALA

Previous chapter brought light in to the remarkable achievements of health development in Kerala in terms of mortality indicators. But, various studies point out that Kerala has not succeeded much in reducing morbidity rate to the extent of other indicators. The morbidity pattern of Kerala may not fall into the same pattern as rest of India or other low income countries. Some of the studies conducted in Kerala demonstrate a peculiar situation as 'low mortality high morbidity syndrome' (Paniker and Soman, 1984; Kannan *et al.*, 1991). Kerala has been passing through an advanced phase of health transition as experienced by the advanced countries, despite remaining economically backward. In spite of all the favorable health indicators used to illustrate Kerala's achievements, substantial part of population still suffer from morbidity related to air and water born disease (Kabir and Krishna, 1991). Hence this chapter attempts to analyse nature and trend in morbidity profile of Kerala.

5.1. Morbidity as a Measure of Health

Mortality indicators are often used as a good proxy for over all community health status. Numerous scientists used infant mortality rate, life expectancy at birth, or age specified death rate as a reasonable measure of health status. By implication, mortality and disability are believed to follow the levels and trends of morbidity. But the link between sickness and death is contradictory. Both loss of life and morbidity are important components of human life. Since the trends in morbidity run counter to trends in mortality, it

135

raises serious questions about the net improvements in the human condition over time.

As a result, in recent past, the measurement of morbidity or state of ill health is being used increasingly as indicator of well being of population in place of conventional indices like death and infant mortality rate that were used to measure social development and social well being. Since morbidity is more common than death and infant mortality rate, it can be measured cost effectively. Disease pattern of a society intimately reflects its standard of living and indeed its whole way of life.

5.2. Meaning of Morbidity

Morbidity is defined by the U.S public Health Service "as a departure from a state of physical or mental well being, resulting from disease or injury, of which the affected individual is aware" (Peterson, 1975). Disease can be considered as something more than mere deviation from health, each disease being a distinct entity, with distinguishing quality as its pathologic process, its typical clinical appearance and often its characteristic pattern of distribution in terms of time, place and person. The concept of disease also varies from one society to another society. There will be no difficulty in distinguishing an illness, which is severe enough to necessitate bed rest and treatment. But milder conditions of disease and in apparent or sub clinical conditions, which do not make these individuals take to bed, are likely to be missed or ignored. Just like borderline health conditions, diseases of mild nature and in apparent or sub clinical conditions are supposed to lie on the middle of a spectrum. At one end of this spectrum is "optimal health "and at the other "serious disease' and in between these two ends various grades of health and diseases are located. The

milder the disease or the more border lines the health, the more difficult it is to differentiate between health and disease.

This point out the difficulty of assessing comprehensive and reliable data on morbidity. For a proper perception of morbidity, we should have information on the frequency and duration of illness, its effects in terms of deviation from the normal state. The socio-economic background of the persons affected, housing, water supply, sanitation, personal.

Hygiene, living conditions and life style would also provide useful information for a true understanding of the genesis of the problems. The WHO Expert Committee on health statistics noted in its 6th report that morbidity could be measured in terms of three units (a) persons who are ill, (b) the illness that these persons experience and (c) the duration.

Three aspects of morbidity are commonly measured by morbidity rates or morbidity ratio, namely frequency, duration and severity. Disease frequency is measured by incidence and prevalence rates. The average duration per case or the disability rate, which is the average number of days of disability per persons, may serve a measure of the duration of illness. Incidence and prevalence rates are widely used to describe disease occurrence in a community.

Incidence rate is defined as 'the number of new cases occurring during a specified time'. The disease prevalence refers to specifically to all current cases (old and new) existing at a given point in time, or over a period of time in a given population.

Park and Park (2000) compared disease of a community to an ice berg. The floating tip of the ice berg represents what the physician sees in the community i.e. clinical cases. The vast sub merged portion of the ice berg represents the hidden mass of disease i.e. in apparent, pre symptomatic and undiagnosed cases and carriers in the community. The 'waterline' represents the demarcation between apparent and in apparent diseases.

One of the defining differences between mortality and morbidity measures of health status is the ease with which the first can be measured against the difficulties that surround measurement of the second. Death is a binary variable, with both subjective and objective components that make quantification difficult.

5.3. Morbidity Profile of India

The study of morbidity pattern become imperative in a sub continent like India with substantial regional, rural-urban and social group differentials in the standard and quality of life. Health for All by 2000 AD was a national goal set by Indian policy makers in Alma-Ata. Since then, a lot of planning efforts and public expenditure has gone into improving human health both in rural and urban India. The spread and accessibility to modern medicine have improved substantially across the country. Despite concerted efforts. However, India continues to be among the many developing countries of the world with high levels of morbidity, especially among infants, children, women and the elderly. There is also a high incidence of communicable diseases normally associated with low levels of sanitation, and public hygiene, poor quality of drinking water and under nutrition.

5.4. Morbidity profile of Kerala.

For the earlier period, since reliable data is not available, Annual Administration Report of Travancore (1900-1901) which contain some data on the number of deaths due to disease is used to show nature and trend in mortality (Panikar and Soman, 1984). During the last quarter of 19th century, plague, small pox and cholera prevailed in Kerala in epidemic form in major part of Travancore. It was informed that though the extent and severity of epidemics like plague, cholera and small pox was considerably brought down in Travancore as compared with the rest of India, these caused heavy mortality in the earlier era. The sharpest decline in death from cholera and small pox was witnessed during the first decade of the last century due to the effective implementation of the immunization program by the then Travancore government. It is also significant that Travancore was free from attacks of plague during this period where as plague took major toll of death in other parts of India. Control of infectious disease was to a considerable extent responsible for the comparatively early decline in the general mortality in Travancore. Even the cases of cholera and small pox declined steadily during this period. No small pox cases were reported in the State consecutively in the years 1968, 1969 and 1970 suggesting virtual abolition of this disease from the state. Kerala achieved the distinction of being the first Indian state reporting 'Zero state' in small pox in the early seventies. Another remarkable feature on the changing spectrum of disease is the remarkable decline in death from fever. Up to 1940s, fever continued more than 27 % of total death and did not show any evidence of a decline over time. This was mainly due to sharp decline in death due to malaria. Active malaria control programs were initiated in the late 1940s in Travancore Cochin and the National Malaria Eradication program started in the fifties. The

incidence of malaria fevers registered a substantial fall ever since the launching of the control measures and Kerala successfully eradicated malaria, long before other Indian states achieved the goal. Even today, when malaria has surfaced in most of the other Indian states, Kerala has not reported any indigenous case. Table 5.1 indicates the trend in the morbidity pattern from 1940 to 1967.

Table 5.1.

Trend in Morbidity

(Number of death from the specific diseases for 10000 total deaths)

Disease	Years		
	1940-47	1956-60	1961-67
Cholera	100.7	4.78	0.3
Small pox	51.7	75	28
Plague	13.2	Nil	Nil
Bowel Disease	1008	597	423
Respiratory Disease	743	1031	1074
All other Disease	5243	7045	6917

Source: Panikar and Soman (1984)

It was informed that the proportion of death from respiratory disease registered an increase since fifties. This was mainly due to diseases like cholera, small pox, malaria etc. and not due to actual increase in respiratory disease.

Panikar and Soman (1984) were among the first to pay attention to the trends in morbidity pattern in the state. They collected data from two apex medical institutions, two private hospitals, and from a few primary health centers. Their study revealed that respiratory infections constituted the largest category of illness. The largest portion of the out- patient treated come under respiratory infection which ranged from 23 % to 35 % in coastal village.

Diarrhoea disorders stand second in terms of proportion of total in patients treated and vary between 11 % and 32 % in these villages with rural hospitals.

Proportion of children with diphtheria and endemic fever showed a marked fall of over 80 % indicating the impact of preventive vaccine and consequent increase in immunity level of child population. Diarrhea, dysenteric disease, gastro intestinal infection, did not reveal any change in spite of substantial increase in medical care facilities attained by the state. Proportion of diarrhea averaged to 80 per 1000 among adults and 200 per 1000 among children.

Tuberculosis that came next constituted 52 per thousand showed a decline from 60 per thousand during 1963-68. Endemic fever was another category that registered a small but steady decline, from 28 to 23 per thousand admissions.

5.5. Chronic Disease

Among chronic disease, cardio vascular disease, cancer hypertension and diabetics emerged. Cancer emerged at the top followed by cardiovascular. Cancer patients increased from 12.1 % to 16.3 % during 1962-63 to 1971-72 and dropped to 12.7 % in 1977-78, where as cardiovascular showed a rising trend from 8.8 to 9.8 and 11 % over the same period.

From the foregoing analysis it was seen that Kerala's morbidity profile consisted of disease related to poverty as well as affluence. Prevalence of diarrhea, dysentery, gastroenteritis, showed lack of minimum health facilities like lack of safe drinking water, sanitation, housing etc. where as existence of

cardiovascular disease, hypertension, diabetics etc. are related to higher income or affluence. Thus, Panikar regarded morbidity profile of Kerala as a mixture of poverty and affluence. His study presented an interesting picture of low overall mortality co-existing with considerable morbidity mostly caused by disease linked to development and poverty.

Another attempt was made by Kannan *et al.* (1987) to study the health and development in rural Kerala that covered morbidity, disability, maternal and child health and health care system etc. The study was based on primary data collected through a health survey covering all Panchayath and with a sample of 9940 population.

As for the morbidity pattern, survey conformed to the study of Paniker and Soman showing the morbidity profile of Kerala consisting of acute infectious diseases and chronic degenerative diseases. Communicable diseases account for 65 % of total morbidity. Fever and diarrhea were the dominant acute illness. The rate of occurrence of fever was estimated at 115.5 per 1000 persons i.e. about 55 % of total diseases and corresponding figure for diarrhea was 22 per 1000 persons i.e. about 10 % of total illness ranking second in the disease pattern. This study compared the morbidity rate estimated at the 28th NSS (1974) results with that of the results of present study both for chronic and acute disease (Table 5.2).

According to the results of KSSP health survey, average morbidity rate of acute disease in Kerala in 1987 worked out to be 206.39 per 1000 persons as against the 1974 (NSS) report of 71 per 1000 population, the highest among all the major States and more than three times the All India average of 23 per 1000

persons. Acute morbidity increased by 190 % during the period from 1974 to 1987.

Table 5.2.

Morbidity Rate per 1000 in Indian Sates (Rural)

Country/state	NSS 1974		KSSP 1987	
	Acute	Chronic	Acute	Chronic
India	22.40	20.98		
Andrapradesh	31.94	17.02		
Asam	17.40	15.84		
Bihar	10.16	23.43		
Gujarat	10.17	6.05		
Haryana	15.96	20.12		
Karnataka	14.92	11.37		
Kerala	71.21	83.68	206.39	138.02
Madyapradesh	20.89	11.65		
Maharashtra	27.57	16.09		
Orissa	24.20	27.81		
Punjab	27.47	22.77		
Rajasthan	17.33	12.76		
TamilNadu	33.99	22.26		
Uttarpradesh	13.22	14.93		
West bengal	27.71	34.59		

Source: NSS, 1974 and KSSP, 1987

Prevalence of chronic disease according to KSSP survey was estimated as 138.02 per thousand people, more than one and a half times the earlier estimate based on NSS data of 1974. The share of bronchial asthma, hypertension, and

143

joint ailments come to 11.27 %, 8.05 % and 12.44 % respectively. In contrast, proportion of persons suffering from some leading chronic disease like heart disease, cancer, and diabetes are relatively small i.e. 3.35 %, 0.63 % and 2.31 respectively.

The incidence of degenerative disease while showing a higher rate among better off section, are also present among the poor. Conclusion drawn from the KSSP study conform to the previous study i.e. morbidity profile of Kerala continues to be dominated by acute communicable illness, and degenerative chronic disease. The so called disease of affluence is emerging on a significant scale.

Another study was conducted by Kunnikannan and Aravindan under the initiative of KSSP in 1996. The study design was identical to the KSSP survey of 1987 to compare the morbidity and health expenditure with 1987 findings. As per 1996 survey, morbidity rate for acute disease was 121.86 and for chronic disease was 114.98 per thousand populations. There is 41 % reduction in the acute morbidity and 16.7 % fall in chronic disease. The proportion declined to 57.93 % in 1996. As a result, the proportion of morbidity due to non communicable disease increased to 42.01 % in 1996 from 32.56 % of 1987. Though there was a change in the proportion, the over all load has recorded a decline. This highlighted the emergence of non communicable disease as the important public health program. The changing life style, increasing life expectancy, better health care and socio-economic change - all have contributed to this epidemic transition.

Many other morbidity studies of Kerala during 1995-96 also supported the above findings i.e. decline in morbidity load and shift from communicable disease to non communicable degenerative disease (Panikar, 1996; Leelamma, 1996 and Ittiyamma 1998) (Table 5.3).

Table 5.3

Morbidity Load per Thousand Population from Different Studies in Kerala

Disease	Years						
	1974 NSS	1987 KSSP	1995 Panikar	1996 KSSP	1998 Ittiyamma	1998 Ittiyamma	1998 Leela
Acute	71.21	206.39	78.9	121.86	108.2	110.95	109.0
chronic	83.68	138.02	58.6	114.6	117.25	153.14	145.0

Source: Research Reports

Except Panikar, all other morbidity study (acute) of 1996 show morbidity rate of 109 to 122 per thousand people. It is still lower in Panikar's study (78.9/1000). Compared to 1987, (KSSP)) study, 1996 shows a 41 % decline in acute morbidity. But, chronic disease has not changed significantly (16.7 % decline). Studies conducted by Leelamma and Ittiyamma on a few primary health centers revealed dominance of chronic diseases and significant changes in the morbidity pattern of Kerala. Morbidity profile of Kerala resembled the characteristics of the morbidity profile of highly developed countries.

Finally, morbidity profile of Kerala for the year 2000 is examined here based on the morbidity statistics of Human development report of the year 2000 (Table 5.4).

Table 5.4.

Prevalence Rate of Short Duration and Major Morbidity by States

Region/States	Short duration morbidity per thousand population				Major morbidity per lakh population
	Diarrhea	Cold	Fever	Total	
Andrapradesh	36	68	31	132	7684
Bihar	39	83	19	132	3817
Gujarat	9	33	18	57	2551
Haryana	29	48	84	153	6697
Kerala	6	75	8	89	7319
Madyapradesh	63	79	60	195	4801
Maharashtra	14	48	26	85	3487
Orissa	54	85	22	143	5011
Punjab	16	104	36	154	6692
Rajsthan	19	72	26	113	3150
Tamilnadu	19	125	27	168	6775
Uttarpradesh	31	51	26	97	3523
West Bengal	45	114	11	164	6168
All India	31	72	25	122	4578

Source: Human Development Report, India-2000

Here an attempt is made to have an interstate comparison of sh duration morbidity and major morbidity. Not withstanding the various fact affecting in the reporting of morbidity, short duration was high in Mac

146

Pradesh, Tamil Nadu, Punjab, Haryana, Orissa and Andrapradesh and low in Gujarat, Maharashtra, Kerala, UttarPradesh and Rajasthan. Among the short duration disease, diarrhea and fever recorded lowest in Kerala, indicating development in the health related sectors like education, housing, water and sanitation and changes in the health habits of the people. Cough and cold didn't show much decline: may be due to higher utilization rate and higher reporting.

But for major morbidity, Kerala stands highest next to Andrapradesh (7684 for A.P and 7319 for Kerala). Point prevalence of morbidity in Kerala is higher than the National average whereas it was lower in case of short duration morbidity (4578 against 7319 and 122 against 89). This may be due to ageing, higher life expectancy, change in diet pattern, change in life style, increasing stress and strains of modern life etc. Major morbidity rises with village development. People in developed villages avail of these facilities and also report better. Major morbidity increases with income and this increase is specially marked in case of hypertension and diabetes. Disease specific prevalence of morbidity for states is presented in Table 5.5. It was seen that Kerala has highest records in terms of hypertension, diabetes, mental disorders and tuberculosis. The picture of morbidity profile of Kerala in the present study also pointed out the dominance of the chronic disease and significant fall in the acute communicable diseases.

Table 5.5.

Prevalence Rate of Major Morbidity (per lakh) by States

	Epilepsy	Hyper tension	Diabetes	Heart Disease	Mental Disease	TB	Leprosy	Cancer	Major Morbidity
Ap	129	1295	545	676	163	580	63	66	7684
Bihar	78	481	143	443	169	496	29	19	3817
Gujarat	103	381	215	188	160	276	30	7	2551
Haryana	103	372	100	230	143	322	-	34	6697
Kerala	81	1433	980	914	283	504	-	39	7319
MP	74	366	138	160	136	686	313	57	4801
Maharashtra	147	241	130	151	84	282	65	62	3487
Orissa	369	863	116	245	99	206	31	74	6692
Punnjab	103	1475	196	166	268	230	-	28	6692
Rajastan	60	64	55	84	79	303	-	37	3158
T.N.	205	1191	377	949	80	5583	83	15	6775
UP	120	221	158	231	120	370	27	34	3523
W.Bengal	133	1049	207	795	151	636	22	32	6168
All India	120	589	221	385	132	423	57	43	4578

Source: Human Development Report India, 2000

Fore going analysis showed that Kerala is passing through an advanced phase of health transition as experienced by the advanced countries in spite of its economic backwardness. Kerala is moving away from the grip of the poverty related diseased to even more dangerous hands of chronic degenerative diseases of affluence, treatment and curing of which is highly expensive. Even prosperous countries are facing formidable problems in responding to this

challenge in spite of having larger resources to allocate and various insurance programs to help the poor, .the destitute and the disabled ones. Both people and government are financially and economically sound in those countries. As against this, in Kerala, average income of the people is too low to afford the high cost and government is passing through severe financial crisis which limits the scope of getting additional resources from government. Kerala has been making efforts to introduce commercialization in government hospitals. Moreover, a direct effect of the new sophisticated advances in diagnostic and curative technology related to new disease profile has been the remarkable escalation of the over all cost of health care both in private and public sector. Thus changes in the morbidity profile have contributed to the escalation of health care cost. Thus, it is said that in Kerala's, development in health sector is in quantitative terms rather than in qualitative terms.

5.6. Notes and references

Short duration morbidity

Short duration morbidity has a reference period of thirty days and is estimated at per thousand basis. Incidence of diarrhea, cough and cold and unspecified fevers during a thirty days reference period preceding the date of survey were considered as short duration morbidity.

Major morbidity

Major morbidity or point prevalence of major morbidity includes diseases such as epilepsy, hypertension, tuberculosis, leprosy and cancer and is estimated on a per lakh population.

Acute Morbidity

Acute morbidity includes infectious diseases such as measles, influenza, diarrhea etc.

Chronic morbidity

Chronic morbidity includes morbidity with limited duration such as tuberculosis, and permanent morbidity such as diabetics, arthritis, hypotension, cancer etc.

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CHAPTER 6

EVALUATION OF PREVENTIVE AND PROMOTIVE MEASURES

This Chapter draws a broad analysis of the preventive measures, its out come evaluation and promotive measures in the study areas. An attempt has been made here to give a brief description of the area profile and development in the organizational structure of health care in the study area. This chapter is divided into five parts:

Part 1   : A profile of the study area

Part 11   : Structural Development

Part 111 : Preventive Measures

Part 1V : Outcome evaluation of preventive measures

Part V : Promotive Measures.

6.1.   A Profile of the Study Area

Thrissur District and Palakkad District has been selected for conducting the present study. Thrissur District, one of the fourteen Districts in Kerala is located approximately at the center of the state with Arabian Sea on the west, Coimbatore District of Tamil Nadu and Palakkad District of Kerala in the east, Malappuram and Palakkad District in the North and Ernakulam District in the south. According to 2001 census, Thrissur district is having a population of 29.75 lakhs distributed over 17 development Blocks comprising 1553393 (52%) females with a sex ratio of 1068 and having a density of population of 981 per

square kilometer. It has 209 villages and 74 % belonged to the rural population. About 12 % of total population belonged to scheduled caste and negligible proportion of population from scheduled tribe. It accommodates 5 Taluks such as (1) Thalappilly, (2) Chavakkad, (3) Thrissur, (4) Mukundapuram and (5) Kodungallur. The literacy rate is 92.56 % with male and female literacy rate of 95.47 and 89.94 % respectively. Analysis of district wise number of families below poverty line according to social groups showed that 33.54 % of families live below poverty line in Thrissur. Thrissur ranks fourth in terms of percentage of families below poverty line.[1]

Thrissur is popularly known as the cultural capital of Kerala. Apart from being the head quarters of a number of cultural institutions, the district situates with many ancient temples including famous Guruvayur temple. Like many other districts in Kerala, Thrissur is also predominantly an agricultural district. But at the same time, the manufacturing sector and social sector are also well developed in the district. A study conducted by Nair and others (1998) places Thrissur in the category of developed district on the basis of composite rank which includes performance in agriculture, manufacturing, education, and health. The per capita district income at 1993-94 prices in 2002-03 is Rs 24456 slightly higher than the per capita State income of Rs 22668.

Kodungallur occupies a unique place in the history of Kerala as 'Muchiri", the capital of Chera Empire. It was otherwise known as Mahodayapuram or Makkodai. It is 38 km south of Thrissur and 42 km north of Cochin. Situated at the mouth of Periyar River it was the most important port in

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[1] Economic Review Kerala 2003 P- S255

Malabar Coast. Kodungallur Block consists of three Panchayats viz. Edavilangu, Eriyad and Methala.

Palakkad District is bounded on the north by Ootacamund Taluk of Nilgiri district and on the east by Mettupalayam, Coimbatore and Pollachi taluks of Coimbatore district of Tamilnadu state, on the south by Mukandapuram taluk of Thrissur district and on the west by the Thrissur and Thalappilly talulks of Thrissur district and ponnani, perinthalmanna and Ernad taluks of Malappuram district. Palakkad district has an area of 4480 sq.kms.Total population of the district according to the 2001 census is 2617072 persons, comprising of 1265794 males and 1351278 females (51.50%) and with a sex ratio of 1068 and having a density of population of 584 per sq.kms. This worked out to be 11.53 % of the total area of the state. The district head quarter is located at Palakkad. The district at present comprises 5 taluks and 13 development blocks. It has 5 towns and 55 inhabited villages. Palakkad district is said to be the granary of Kerala state. Paddy is the principal crop. It is predominantly an agricultural area and industrially backward due to lack of power supply and communication facilities. Palakkad ranks 13th in per capita income (Rs.19501) 14th being Malappuram (Rs 16766). Palakkad reported lowest literacy in the State as per 2001 census. Literacy rate is 84.31% with male literacy of 89.73% and female literacy rate of 79.31%. Palakkad stands at the bottom in terms of percentage of families below poverty line. Fifty two percentages of families live below poverty line in Palakkad. It accommodates 5 Taluks viz: Ottappalam, Palakkad, Chittur and Alathur and 13 community development blocks. Literacy rate of Chittur recorded 68.50%, lowest rate in Palakkad next to Attappady (57.67 %).

6.2. Structural Development

Health status of the population is influenced by its access to effective medical and health care services. A major factor which contributed to the present level of health development is the vast health care infrastructure which has facilitated easy access to institutional care. The wide range of medical care institutions in Kerala had a decisive role in the improvement of the health status of the population is well known[2]. Hence, in this section, development in the health infrastructure, hospital beds and health manpower in the study area is examined. Since the intervention of the state in providing health care directly to the people is an important feature of the health care system in Kerala, a brief account of the organizational structure is given below.

Present study confined to the development of the organizational structure of the modern medicine or allopathic system only, since it is the dominant one.

With regard to the infrastructural development, it was seen that number of government allopathic medical institutions in Thrissur and Palakkad was 110 and 100 respectively in 1990. It increased to 111 and 102 in 1991 and further to 123 and 115 in 2003. Number of primary health centers, Community health centers and sub centers in Thrissur worked out to be 87, 9, and 492 respectively, with 459 beds in primary health centers and 323 beds in community health centers in 2003. Palakkad recorded 82 primary health centers 12 community health centers, and 471sub-centers with bed strength of 589 in primary health centers and 527 in community health centers. On an average 90% of the population is having a public hospital with in five kilometers and

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[2] KRPPL: Panikar (2000) p- 36

more than 75 % is having a public hospital with in a ten kilometer distance. Average bed strength in primary health center is 5 to 4. National pattern of community health center is 30 beds and 5 specialties. In Kerala, the average beds in Community health center is 40. It varies from 29 beds in Kasaragod to 51 beds in Palakkad.

Table 6.1.

Health Care Infrastructure

THRISSUR

Year	Institution		Hospitals		Beds per lakh population	PHC		CHC	
	No	Beds	No	Beds		No	Beds	No	Beds
2000	122	4264	18	3518	138	87	4455	9	295
2002	123	4442	18	3518	159	87	425	9	323
2003	123	4504	16	1147	161	87	459	9	323

Source: Economic Review: various issues, State Planning Board, Trivandrum

Table 6.2

Health Care Infrastructure

PALAKKAAD

Year	Institution		Hospitals		Beds per lakh population	PHC		CHC	
	No	Beds	No	Beds		No	Beds	No	Beds
2000	112	2208	8	1151	93	86	652	8	405
2002	115	2450	8	1147	101	85	655	9	461
2003	115	2450	8	1147	101	82	589	12	527

Source: Economic Review: various issues, State Planning Board, Trivandrum.

158

6.2.1. Bed Population Ratio

The ratio of population to a hospital bed is a standard index of the availability of curative services. Number of beds per lakh population in Thrissur increased from 138 in 2000 to 161 in 2003. In Palakkad, beds per lakh population increased from 93 to 101 during the same period. Bed population ratio compares favorably even with high income countries in both divisions. (Annexure 6.1).

6.2.2. Health Man Power

With regard to the health manpower in government allopathic institutions[3] it was seen that there were 308 medical officers in Thrisur during the year 2000.It declined to 275 in 2003. In Palakkad, number of medical officers declined from 245 to 205 during the same period. Number of nurses increased from 756 in 2000 to 775 in 2003. But, Palakkad recorded 31 % fall in the number of nurses between the years 2000 and 2003.Number of pharmacist showed 14 % fall in Thrissur and 10 % fall in Palakkad. Number of lady health inspectors recorded 35 percentage increases in Thrissur, but Palakkad recorded 22 percentage falls. Thus it was seen that there has been significant fall in the health personals working in the government institutions in both divisions though Palakkad recorded higher rate than Thrissur. This may be due to the shifts of health personals from public to private institutions. Structural development in the study areas compares favorably with those of developed ones.

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[3] No official data was available related to private health care facilities.

Table 6.3.

Health Man Power in Thrissur and Palakkad

Year	Thrissur				Palakkad			
	Medical officers	Nurses	Lady health inspectors	Pharmacist	Medical officers	Nurses	Lady health inspectors	Pharmacist
2000	308	756	73	174	245	504	81	134
2002	308	776	99	174	245	418	80	134
2003	275	775	99	149	205	344	63	120
2004	278	775	99	149	205	344	62	120

Source: 1. Economic Review: Various issues, State Planning Board, Trivandrum

2. DHS, Trivandrum

6.3. Preventive Measures

Preventive Services relate to improving family welfare. The process evaluation of family welfare program includes 1. Family Planning Programs and 2. Maternal and Child Health Care.

6.3.1. Achievement of Family Welfare Program in Thrissur and Palakkad District

The target and achievement of family planning program of the family welfare program in Thrissur and Palakkad district can be examined under the following heads.

Sterilisation

Given the fact that most couples in India complete their family by the time they are in their mid 20s and marriage is a socially stable institution, sterilization is the most logical, safe and cost effective contraception to protect the young couples against unwanted pregnancies. In the implementation of the family welfare program, initially reliance was on the rhythm method. Later, it was shifted to form tablets, jellies, diaphragms and condoms. With advent of Intra Uterine Contraceptive Device, loops joined the condoms and vasectomy has become a method of primary emphasis. Since 1964, the major flank of the program is the terminal method i.e. sterilization which is the safest, simplest, and most effective method of contraceptive. The introduction of laproscopic techniques for female sterilization has also contributed to its promotion. An idea of targets and achievements under strilisation program of Palakkad and Thrissur during the period 1991 to 2001 can be had from the Table 6.4 and 6.5 respectively. It was striking to note that the performance of family welfare program in terms of achievements of target in sterilization in Thrissur is impressive, by far exceeding the target in most of the period under study. The highest rate of achievement was witnessed during the year 1998-99. As against this, in Palakkad, in most of the years percentage of achievement was far below the targeted level. Highest rate of achievement was recorded during the year 1998-99 both in Palakkad and Thrissur and lowest rate of 65% in Palakkad was recorded in the year 2000-01. It was seen that during the last two years Palakkad showed better performance than Thrissur (Figure 6.1.).

Table 6.4.

Target and Achievement under Sterilization Palakkad

Years	Need Assessed	Achievement	% of Achievement	% of increase or decrease from last year of achievement
1991-92	14491	12419	85.7	-
1992-93	12900	11021	85.4	-11
1993-94	10800	9282	85.9	-16
1994-95	10800	10711	99.2	+15
1995-96	12923	11889	91.9	+11
1996-97	11068	10924	98.7	-8
1997-98	10800	10210	95.0	-7
1998-99	9750	12017	123.0	+18
1999-2000	13000	12799	97.0	+7
2000-01	12610	12054	65.6	+6
2001-02	13160	12357	94.0	+3
2002-03	12560	12010	94.0	-3

Source : 1. Health Administration Report: Health Service Department, Government of Kerala. Various issues.

2. Monthly bulletin on family welfare program, Health information cell, DHS, Trivandrum.

3. Facility survey RCH project for Kerala, Thrissur (1999),.Ministry of health and family welfare, Government of India.

Table 6.5
Target and Achievement under Sterilization Thrissur

Years	Need Assessed	Achievement	% of Achievement	% of increase or decrease from last year of achievement
1991-92	14496	17381	119.9	-
1992-93	12000	13154	109.4	-24
1993-94	10000	10244	102.4	-22
1994-95	10000	10260	102.6	+16
1995-96	10000	10558	105.6	+3
1996-97	9210	9407	102.1	-11
1997-98	10000	12000	120.0	+28
1998-99	10000	12289	123.0	+3
1999-2000	12000	13676	114.0	-11
2000-01	14300	14616	102.0	7
2001-02	15100	13853	92.0	-5.2
2002-03	15700	12756	80.0	-8

Source : 1. Health Administration Report: Health Service Department, Government of Kerala. Various issues.

2. Monthly bulletin on family welfare program, Health information cell, DHS, Trivandrum.

3. Facility survey RCH project for Kerala, Thrissur (1999),.Ministry of health and family welfare, Government of India.
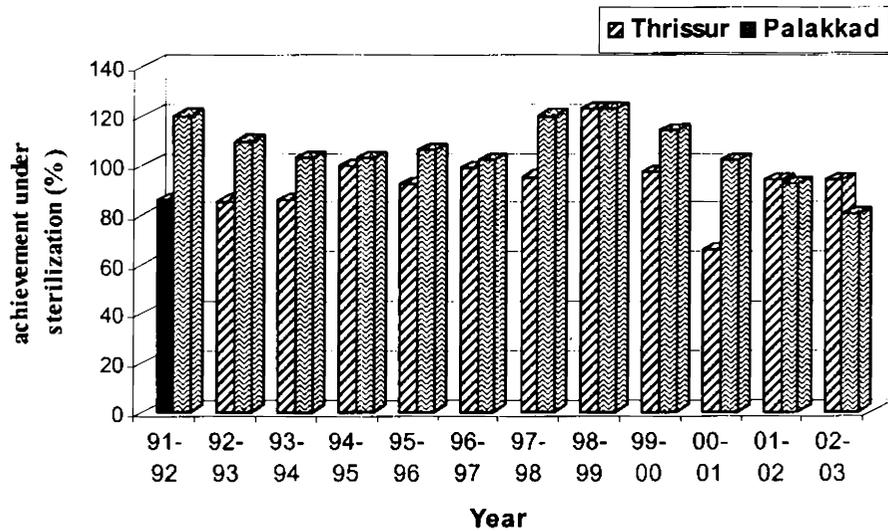
Figure 6.1. Percentage of achievement in sterilization for the two districts

Break up of this sterilization into vasectomy and tubectomy (male and female sterilization) reveals that in both areas male sterilization is not popular. Men play an important role in determining education and employment status, age at marriage, family formation pattern, access to and utilization of health and family welfare services for women and children. Vasectomy is considered as a simpler, safe, and less expensive operation than tubectomy in terms of instruments, hospitalization and doctors training. Cost-wise, it is said that the ratio is about five vasectomies to one tubal ligation. Male sterilization or vasectomy being a comparatively simple operation can be performed even in primary health centers by trained doctors under local anesthesia. When carried out under strict conditions, it should have no risk of mortality. But it is striking to see that currently, female sterilization account for 97.2 % of all sterilization in India and 99.67 in Kerala in 1995-96, in spite of the fact that male sterilization is

simpler, safe and cheaper than female sterilization[4] In 1996-97, the rate again increased to 98.1 in India and 99.7 for Kerala (Table 6.6).

Table 6.6.

Percentage of Achievement under Sterilization for Males and Females Thrissur and Palakkad

Year	Thrissur		Palakkad	
	Male	Female	Male	Female
1991-92	0.97	99.03	0.26	99.74
1992-93	0.87	99.13	0.11	99.89
1993-94	0.61	99.39	0.04	99.96
1994-95	0.43	99.57	0.06	99.94
1995-96	0.45	99.55	0.03	99.97
1996-97	0.33	99.67	0.04	99.96
1997-98	0.26	99.74	0.03	99.97
1998-99	0.19	99.81	0.05	99.95
1999-00	0.45	99.55	0.03	99.97
2000-01	0.51	99.49	0.30	99.70
2001-02	0.02	99.98	0.30	99.70
2002-03	0.19	99.81	0.29	99.71

Source :1. Health Administration Report: Health Service Department, Government of Kerala. Various issues.
2. Monthly bulletin on family welfare program, Health information cell, DHS, Trivandrum.
3. Facility survey RCH project for Kerala, Thrissur (1999),.Ministry of health and family welfare, Government of India.

It was evident from the Table 6.6 that in Thrissur there has been a steep fall in the number of vasectomy during the period under study. Proportion of vasectomy which was 0.9 % in 1991-92, declined to 0.19 % at the end of the period in Thrissur. Where as in Palakkad it remained as 0.2 % for the same period. Both areas recorded marginal participation of males in sterilization indicating one sided participation in streilisation showing male domination (Figure 6.2 and 6.3). Though Kerala stands with high female literacy and a favorable sex ratio and women enjoy a better position than else where in the

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[4] Family welfare program in India (1996-97), Year Book. Family Welfare Program in India: Department of Family Welfare; Government of India; New Delhi

country. Participation rate of men in sterilization is practically nil as seen in other parts of country.
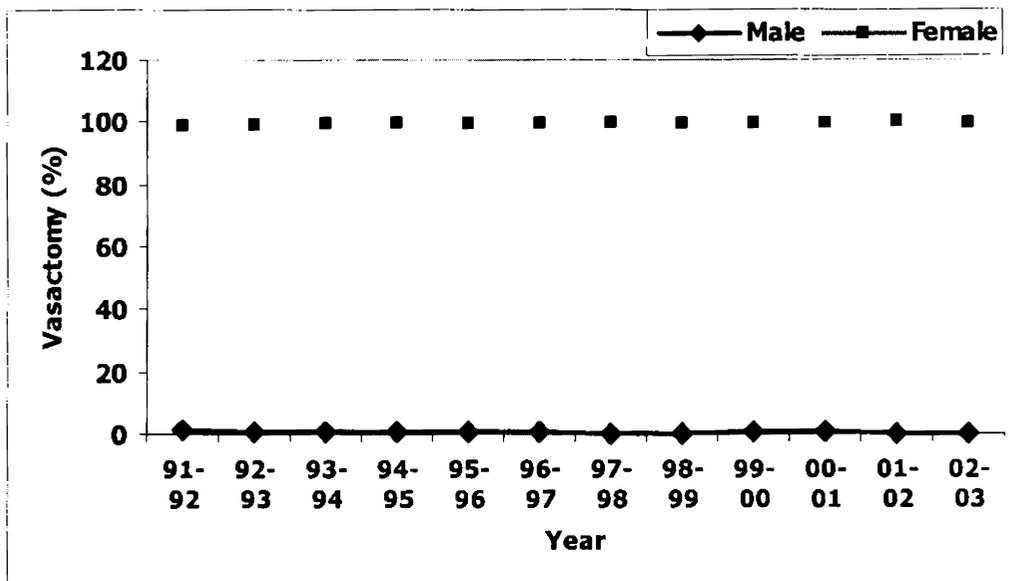
Figure 6.2. Percentage of Achievement in Sterilization of Males and Females of Thrissur District
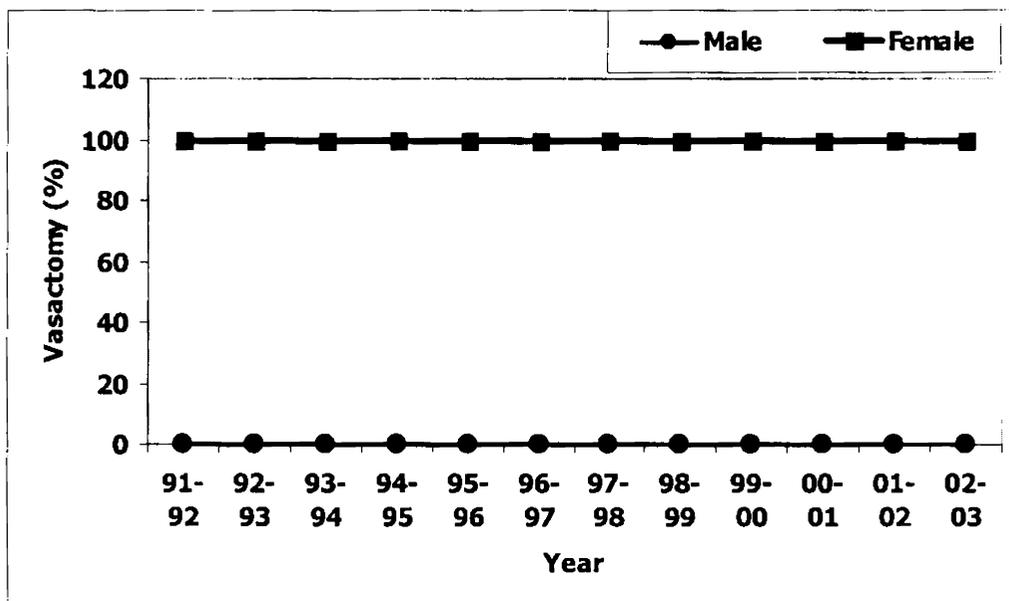
Figure 6.3. Percentage of Achievement in Sterilization of Males and Females of Palakkad District

165

Vasectomy, which was safer and simpler than tubectomy was widely accepted in the sixties. However, after 1977, there had been a steep and continuous decline in vasectomies. There is a need to find out and address the needs and conveniences of men seeking vasectomy and provide ready access to vasectomy services both in rural and urban areas. During ninth plan period, due attention was there fore given to enhance men's participation in the Planned Parenthood movement. It was stated in the ninth plan that "if attempts were made to re popularize vasectomy so that this safe, simple procedure forms at least 50 % of all sterilization, there will be a further substantial reduction both in the morbidity, mortality and in the cost of permanent methods of contraception[5].

6.3.2. Technique Wise Achievement of Sterilization

Break up of female sterilization into its different components of PPS, Minilap and laproscopy shows that PPS is considered to be the most popular method in both Palakkad and in Thrissur district. It was seen from the Table 6.7 that laproscopy, which constituted 20 % of the female sterilization in Thrissur, in 1991-92 has gone to 29 % at the end of the study periods as against the decline in the share of laproscopy from 43 % to 22 % in Palakkad for the same period. Thus, Thrissur shows increasing preference for laproscopy, reverse is the case in Palakkad. In terms of achievements in sterilization, it was seen that both districts performed well though Palakkad lags behind Thrissur. Lower rate of achievement than the targeted level in recent years in Thrissur may be due to the changes in the pattern of target fixing from the center. Poor performance in relation to the target in the last years in Thrissur points to the

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[5] Ninth five year plan (1997-02). volume 11. Government of India, Planning Commission New Delhi.

disappointment with the need assessment forms in the new manual prepared by the government. The better performance in Palakkad in the achievement of target in Palakkad may be due to the effect of special privileges extended to this area considering it as the disadvantaged District in terms of reproductive and Child Health Care by the Ministry of Health.

6.3.3. Temporary methods

Intra uterine contraceptive device

IUD is one of the most effective reversible contraceptive methods with an average pregnancy rate after one year of about 3-5 per 100 typical users. Unlike surgical operation under the sterilisation program, this method involves insertion of copper 'T' shaped loop in the females with the help of the doctor. This method is meant only for women. It is a temporary method of contraception. The theoretical effectiveness of IUD is less than that of oral and injectable hormonal contraceptive. But, since IUDs have longer continuation rate than the hormonal pills or injection, the overall effectiveness of IUDs and oral contraceptives are same in family planning. The target and achievement under the intra uterine contraceptive device program during the year 1991-1992 are furnished below (Table 6.8).

Table 6.7.
Technique Wise Achievement of Sterilization

Year	Thrissur					Palakkad				
	Sterilization	Vas	Pps	Mini lap	Laproscopy	Sterilization	Vas	pps	Mini lap	Lap scopy
1991-92	17381	168	12153	1583	3477	12419	32	6069	912	5406
1992-93	13154	115	8784	1350	2905	11021	12	5212	718	5709
1993-94	10244	62	6734	1117	2333	9282	4	4468	624	4129
1994-95	10260	44	6824	808	2584	10711	6	5615	473	4617
1995-96	10558	48	7118	798	2594	11889	3	6463	520	4903
1996-97	9407	31	7176	788	1412	10924	4	6297	532	4091
1997-98	12000	31	8954	1705	1310	10210	3	7496	546	3257
1998-99	12289	23	10002	1049	1215	9750	5	7866	596	3737
1999-2000	13676	62	10782	1711	1121	12799	4	8700	614	3481
2000-01	14616	75	10779	1314	2448	12054	36	8960	759	2299
2001-02	13853	22	9964	1250	2617	12357	37	9512	701	2107
2002-03	12756	24	8224	869	3639	12010	35	8781	536	2658

Source: 1. Health Administration Report: Health Service Department, Government of Kerala. Various issues.
2. Monthly bulletin on family welfare program, Health information cell, DHS, Trivandrum.
3. Facility survey RCH project for Kerala, Thrissur (1999), Ministry of health and family welfare, Government of India.

168

Table 6.8.
Target and Achievement under IUD

Years	Thrissur			Palakkad		
	Target	Achievement	%	Target	Achievement	%
1991-92	1200	11532	96.2	8800	8814	106.2
1992-93	1031	8808	85.4	8050	8533	106.2
1993-94	9500	8227	86.6	7600	7095	93.4
1994-95	10200	7236	71	8200	7550	77.4
1995-96	8669	7421	85.6	9189	7848	85.4
1996-97	8965	7027	73.6	7334	6755	92.1
1997-98	10506	6598	62.8	8142	7702	94.6
1998-99	10500	6740	64	9700	9209	95
1999-2000	7424	6481	87.3	9392	9223	98.2
2000-01	7102	7127	100.3	9350	9628	102.97
2001-02	7300	6925	94.9	10000	7920	79.2

Source : 1. Health Administration Report: Health Service Department, Government of Kerala. Various issues.
2. Monthly bulletin on family welfare program, Health information cell, DHS, Trivandrum.
3. Facility survey RCH project for Kerala, Thrissur (1999),.Ministry of health and family welfare. Government of India.
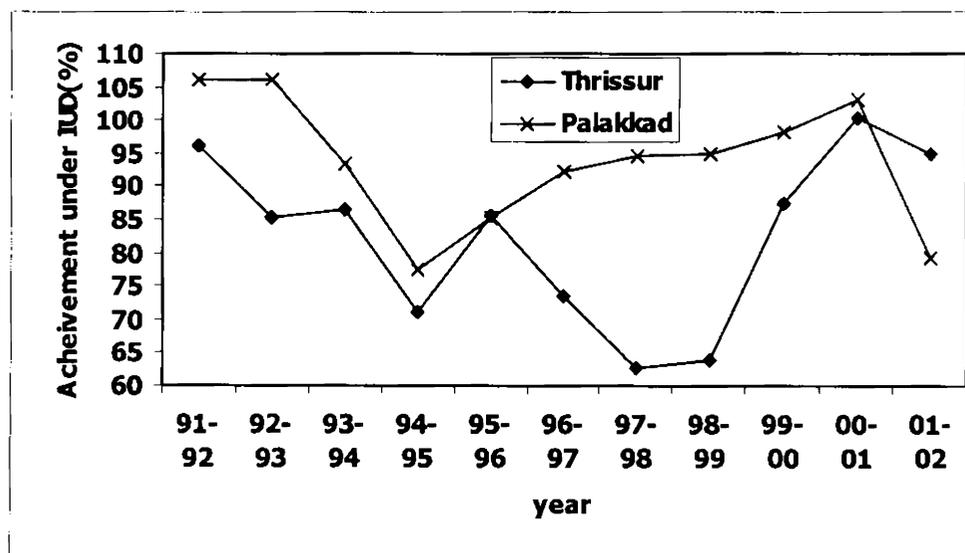
Figure 6.4. Percentage achievement in IUD in both the Division

A cursory glance at the annual target for intra uterine contraceptive device in Trtichur shows that achievement in IUD is less than the target in most of the period. From 1991 to 2000, Palakkad showed better performance than Thrichur (Figure 6.4). In Thrissur, during 97-99, the achievement was very poor and it declined to 70 %. During 2000-01, both the divisions showed hundred percentage achievements. A decrease in the rate was noted during 2001-02 in both the divisions in which Palakkad district stood behind Thrissur. Compared to the achievement in sterilisation, this method has not much acceptance among the people since this method is only used for spacing in a temporary basis and not for prevention of child birth.

Conventional Contraceptives

Conventional contraceptives (CC) consist of condoms and cervical caps. The contraceptives for men are known as condoms and that for women is called cervical caps. They are distributed freely by the health centers so as to induce the males to make use of them to postpone child birth and space of and not to avoid it. Trend in umber of CC users and number of CC pieces distributed for 1991 to 2001-02 for Thrisshur and Palakad is shown in Table 6.9. There has been steady decline in the number of users and number of CC pieces distributed in both areas during the period under study. Number of CC users declined from 23576 to 9052 in Thrissur showing a decline of 38% and number of CC pieces distributed declined from 1628951 to 652029 showing 40% decline for the same period. Palghat also recorded around 40 % decline in terms of number of CC users and number of CC pieces distributed for the same period. Thus, as far as the use of conventional contraceptive methods is concerned, both areas do not show much difference.

170

Table 6.9.

Conventional Contraceptive

Years	Thrissur		Palakkad	
	No users	No of CC pieces distributed	No of CC users	No of CC pieces distributed
1991-92	23576	1628951	19795	1487642
1992-93	21967	1583256	17255	1434578
1993-94	17171	1485473	18402	1454612
1994-95	21662	1560155	22156	1595361
1995-96	22696	1634708	18334	1320076
1996-97	16172	1164738	13900	1000830
1997-98	17124	1213505	14256	1039767
1998-99	16348	1191429	16478	1356418
1999-2000	13932	987389	17526	1471555
2000-01	10535	759387	12920	930672
2001-02	9052	652029	8299	597963

Source :1. Health Administration Report: Health Service Department, Government of Kerala. Various issues.
2. Monthly bulletin on family welfare program, Health information cell, DHS, Trivandrum.
3. Facility survey RCH project for Kerala, Thrissur (1999),.Ministry of health and family welfare, Government of India.

Oral Pill Users

It is one of the easiest and cheapest of all the methods adopted by female population. The combined pill is one of the major spacing methods of contraception. Table 6.10 reveals that the number of Oral Pill (OP) users decreased from 3290 to 2571 and the number of OP cycles from 45438 to 33428 in Thrissur from 1991 to 2001-02. Palakkad showed only marginal change in terms of number of OP users. Comparative analysis of the two areas is shown in Table 6.10.

Table 6.10.

Oral Pills

Years	Thrissur		Palghat	
	No of OP users	No of OP cycles distributed	No of OP users	No of OP cycles distributed
1991-92	3290	45438	2589	-
1992-93	3031	44235	2090	-
1993-94	2635	41168	2264	-
1994-95	3279	42629	3043	39562
1995-96	3298	42879	2670	14715
1996-97	3221	41869	2438	31697
1997-98	3118	39100	2643	33609
1998-99	2908	38318	2826	37829
1999-2000	2808	36507	3072	39935
2000-01	2886	37515	2972	38633
2001-02	2571	33428	2507	32599

Source :1. Health Administration Report: Health Service Department, Government of Kerala. Various issues.
2. Monthly bulletin on family welfare program, Health information cell, DHS, Trivandrum.
3. Facility survey RCH project for Kerala, Thrissur (1999),.Ministry of health and family welfare, Government of India.

Table 6.10 revealed that, OP users in both areas are found to be far less compared to other methods. Method of OP seems to be the most unpopular one in the study areas. It may be due to malignancy leading to cancer and hormonal imbalances, resulting in overweight. Contraceptives must be regular at prescribed cycles, though the process is monotonous. A small drop out may not give the required result at all. Women may not like this because of the risk involved in it.

Stage is now set to study percentage distribution of persons using different methods of contraception in Palakkad and Thrissur. With regard to the total number of persons using any method of contraception, it was found that there has been steady decline in the number of persons using any method

of contraception in Thrissur from 67410 in 1986 to 55779 in 1991 and then to

32401 in 2001. This shows 17% decline from 1991 to 2001.

Table 6.11.

Percentage of People using Different Methods of Contraception –Thrissur

Years	Sterilis	% of ach:	IUD	% of ach:	CC Users	% of ach	OP Users	% of ach:	Total
1986	20551	30	6600	10	38252	57	2001	3	67410
1991	17381	31	11532	21	23576	42	3290	6	55779
1992	13154	28	8808	19	21967	47	3031	6	46960
1993	10244	27	8227	21	17171	45	2635	7	42437
1994	10260	24	7236	17	21662	51	3279	8	43973
1995	10558	24	7421	17	22696	52	3298	8	35827
1996	9407	26	7027	20	16172	45	3221	9	38840
1997	12000	31	6598	17	17124	44	3118	8	38285
1998	12289	32	6740	18	16348	43	2908	8	36897
1999	13676	37	6481	18	13932	38	2808	7	35164
2000	14616	42	7127	20	10535	30	2886	8	32401
2001	13853	43	6925	21	9052	28	2571	8	

Source : 1. Health Administration Report: Health Service Department, Government of Kerala. Various issues.
2. Monthly bulletin on family welfare program, Health information cell, DHS, Trivandrum.
3. Facility survey RCH project for Kerala, Thrissur (1999),.Ministry of health and family welfare, Government of India.

With regard to the different methods, it was seen that percentage of

people undergone sterilization has increased from 30 % in 1986 to 26 % in

1996 and to 43 % in 2001 in Thrissur. Share of IUD increased from 10 % to 21

% while share of CC users declined drastically from 57 % to 28 % during the

period 1986 to 2001.

In Palakkad, among the different methods, sterilization has been more popular than other methods. But its share declined from 46 % in 1986 to 28 % in 1991 and then to 40 % in 2001, while the share of IUD increased from 15 % in 1986 to 20 % in 1991 and then to 25 % in 2001. Percentage of people using CC declined from 34 % in 1986 to 27 % in 2001. In 1994, it was seen that among the total acceptors, CC users constituted larger share i.e. 51 %, but since then, the rate recorded a steady decline to 27 % in 2001(Table 6.12).

Table 6.12

Percentage of People using Different Methods of Contraception - Palakkad

Years	Sterilis	% of ach:	IUD	% of ach:	CC Users	% of ach	OP Users	% of ach:	Total
1986	18226	46	5879	15	13412	34	2260	5	39777
1991	12419	28	8814	20	19795	45	2589	6	43617
1992	11021	28	8533	22	17255	44	2090	6	38899
1993	9282	25	7095	19	18402	50	2264	6	37043
1994	10711	25	7550	17	22156	51	3043	7	43460
1995	11889	29	7848	19	18334	45	2670	7	40741
1996	10924	32	6755	20	13900	41	2438	7	34017
1997	10210	29	7702	22	14256	41	2643	8	34811
1998	12017	30	9209	23	16478	41	2826	7	40530
1999	12799	30	9223	22	17526	41	3072	7	42620
2000	12054	32	9628	26	12920	34	2972	8	37574
2001	12357	40	7920	25	8299	27	2507	8	31083

Source : 1. Health Administration Report: Health Service Department, Government of Kerala. Various issues.
2. Monthly bulletin on family welfare program, Health information cell, DHS, Trivandrum.
3. Facility survey RCH project for Kerala, Thrissur (1999),.Ministry of health and family welfare, Government of India.

6.3.4. Maternal and Child Health Care

Process evaluation of maternal and child care program of Thrissur and Palakkad can be examined under the following heads.

TT Pregnant Woman

Table 6.13.

TT Pregnant Women

Year	Thrissur			Palghat			State		
	Need	Ach	Per	Need	Ach	Per	Need	Ach	Per
1991-92	54140	56523	104.4	47048	51218	108.9	574422	608204	105.9
1992-93	54558	53127	97.3	47786	45683	95.6	567894	572450	100.8
1993-94	55000	49892	88,2	48200	42909	89.0	594150	542860	91.4
1994-95	53200	53223	100	46400	41712	89.9	565800	532905	94.2
1995-96	54129	51639	95.4	47854	45126	94.3	578493	567843	98.1
1996-97	54900	49210	89.6	48400	38893	82.4	582700	507257	87.1
1997-98	54725	46735	85.4	48237	46645	96.7	582459	568432	97.6
1998-99	54889	42484	77.4	48391	48488	100.2	582937	529307	90.8
1999-2000	46000	45443	98.8	50565	46568	92.1	586096	553752	94.5
2000-01	48775	47510	97.4	50180	47469	94.6	598983	546717	91.3
2001-02	44000	45191	102.7	34557	47778	138.3	549452	531821	96.8

Source :1. Health Administration Report: Health Service Department, Government of Kerala. Various issues.
2. Monthly bulletin on family welfare program, Health information cell, DHS, Trivandrum.
3. Facility survey RCH project for Kerala, Thrissur (1999),.Ministry of health and family welfare, Government of India.

With regard to TT pregnant woman vaccination, it was seen that in 1991-92 and in 2001-02, percentage of achievement far exceeded the target, both in Palakkad and Thrissur. Lowest rate of 77.4 % was recorded in Thrissur

in the year 1998-99, while Palakkad attained 100.2 % for the same period (Table 6.13).

B C G Vaccination

BCG vaccination can be given at birth or within six weeks. The aim is to induce resistance to infection from primary tuberculosis among those most at risk and thus to reduce morbidity and mortality among infants. The quantitative performance of the program has been generally found to be impressive in terms of percentage of achievement in BCG vaccination in both divisions. In Thrissur, in eight out of ten years, the level of performance far exceeded the target and in Palakkad also achievement far exceeded the target, in nine out of ten years.

Table 6.14.

BCG

Year	Thrissur			Palakkad			State		
	Need	Ach	Per	Need	Ach	Per	Need	Ach	Per
1991-92	52968	53127	100.3	46016	55817	121.3	561533	638463	113.7
1992-93	50135	51439	102.6	50317	53235	105.8	564395	624786	110.7
1993-94	51973	47036	90.5	45478	48752	107,2	559014	607648	108.7
1994-95	49975	50075	100.2	43598	55718	127.8	532093	610311	114.7
1995-96	51050	53450	104.7	44905	53167	118.4	542890	601523	110.8
1996-97	51591	56234	109.0	44891	50054	111.5	548277	591591	107.9
1997-98	50813	58435	115.0	44578	55678	124.9	544139	613245	112.7
1998-99	51599	62332	120.8	44912	59509	132.5	548241	638701	116.5
1999-00	64402	63000	97.8	52200	27337	106.8	597363	668343	111.9
2000-01	59000	67299	106.6	57800	57715	99.8	638873	663189	103.8
2001-02	47000	55797	118.7	45630	59030	129.4	536006	613663	114.5

Source :1. Health Administration Report: Health Service Department, Government of Kerala. Various issues.
2. Monthly bulletin on family welfare program, Health information cell, DHS, Trivandrum.
3. Facility survey RCH project for Kerala, Thrissur (1999), Ministry of health and family welfare, Government of India.

DPT

National policy is to immune against diphtheria, whooping cough and tetanus simultaneously by administering three doses of DPT vaccine at 1-2 months interval, starting when the infant is about six weeks old. Three doses of

DPT and polio are to be given to a child at the age of six weeks and 14 weeks respectively. Both are administered simultaneously to children and hence generally, the percentages of children having three doses of DPT and three doses of polio can be the same. But in certain situations like when the child is ill or when vaccine is not available, the percentages will be different. The infant can be immunized simultaneously against three diseases via, diphtheria, pertusis, and tetanus which is a great gain administratively. Pertusis component in DPT vaccine enhances the potency of the diphtheria toxoid. If pertusis is prevalent in the community, immunization can be started earlier at the age of one month. At this age immune response is poorer, but some feel that the partial protection obtained is better than no protection. A booster dose of DPT is indicated at the age of 18-24 months.

Table 6.15.

Target and Achievement in DPT Vaccination

Year	Thrissur			Palghat			State		
	Need	Ach	Per	Need	Ach	Per	Need	Ach	Per
1991-92	52949	53026	100.2	46013	49957	108.6	561785	573744	102.1
1992-93	52456	53487	104.0	46789	47345	101.2	547613	553687	101.1
1993-94	52000	52820	102.0	45500	40910	89.9	559200	556257	99.5
1994-95	50000	50110	100.2	43600	50351	115.5	532000	567001	106.
1995-96	53568	56346	105.2	45231	46678	103.2	563267	523512	92.9
1996-97	51600	55490	107.5	44906	48940	109.0	548300	558180	101.8
1997-98	52879	53276	100.8	47126	46125	97.8	586321	547236	93.3
1998-99	51890	57079	110	45090	60421	134	548170	596410	108.8
1999-00	59000	56394	95.6	52200	59727	114.4	55689	588002	105.8
2000-01	59000	61225	103.8	59000	61241	103.8	638873	594713	93.1

Source : 1. Health Administration Report: Health Service Department, Government of Kerala. Various issues.
2. Monthly bulletin on family welfare program, Health information cell, DHS, Trivandrum.
3. Facility survey RCH project for Kerala, Thrissur (1999), .Ministry of health and family welfare, Government of India.

With regard to achievement in DPT, in Thrissur, percentage of achievement is above 100 % in all the years except in 1999-2000. In Palakkad also, percentage of achievement is higher than the target in eight out of 10 years (Table 6.15).

Oral Polio Vaccination

The WHO program on immunization and the national immunization program in India, recommended a primary course of three doses of OPV at one month interval, commencing the first dose when infant is six weeks old. This is because most polio cases occur between the ages of six months and three years. One booster dose of OPV is recommended 12 to 18 months later. This scheme of immunization is in operation since November 1979.

Table 6.16.

Oral Polio Vaccine

Year	Thrissur			Palghat			State		
	Need	Ach	Per	Need	Ach	Per	Need	Ach	Per
1991-92	52922	53081	100.3	46007	50746	110.3	561763	587605	104.6
1992-93	53163	52578	98.9	53602	52316	97.6	563478	579255	102.8
1993-94	51808	48181	93.0	45501	41497	91.2	559428	555512	99.3
1994-95	50002	50103	100.2	43611	51548	118.2	532209	576915	108.4
1995-96	53410	54692	102.4	51281	53127	103.6	552414	578930	104.8
1996-97	51581	55037	106.7	44912	49089	109.3	548393	565942	103.2
1997-98	52172	57128	109.5	44583	46723	104.8	533420	573427	107.5
1998-99	51589	58399	113.2	548103	605654	110.5	548103	605654	110.5
1999-00	59500	56710	93.3	52350	58011	110.8	546127	584261	106.9
2000-01	59000	61241	103.8	57800	59011	102.1	638873	592775	92.8

Source :1. Health Administration Report: Health Service Department, Government of Kerala. Various issues.
2. Monthly bulletin on family welfare program, Health information cell, DHS, Trivandrum.
3. Facility survey RCH project for Kerala, Thrissur (1999), .Ministry of health and family welfare, Government of India.

Performance of both these divisions in terms of achievement in polio vaccine is remarkable by attaining more than the target in most of the years.

Measles

Measles is best prevented by active immunization. A child is expected to get measles vaccination when it is nine months old. The rate of achievement in measles in Thrissur and Palakkad is 99.5 % and 94.2 % respectively in 1991-92. Since then the rate recorded a steady decline to 85.3 % and 74.7 % in Thrissur and Palakkad. Thrissur recorded more than 100 % achievement in 1994, 1998 and 2001. Palakkad could achieve the target in 1998 and 2001 and the rate attained stands ahead of the corresponding rate of Thrissur for the same periods (Table 6.17).

Table 6.17.

Measles

Year	Thrissur			Palghat			State		
	Need	Ach	Per	Need	Ach	Per	Need	Ach	Per
1991-92	52937	52672	99.5	46033	43363	94.2	562844	512188	91.2
1992-93	52304	51467	98.4	44392	38754	87.3	553467	512678	92.6
1993-94	51987	44345	85.3	45502	33990	74.7	559071	493660	88.3
1994-95	49994	50044	100.1	43585	41145	94.4	537029	518233	96.5
1995-96	48933	48248	98.6	43032	40278	93.6	510603	503455	98.6
1996-97	51598	49689	96.3	44906	39338	87.6	547998	501418	91.5
1997-98	52792	51789	98.1	51038	47823	93.7	557994	543487	97.4
1998-99	51575	52452	101.7	44894	53603	119.4	548385	562643	102.6
1999-00	55000	52170	94.9	52200	48088	92.1	539218	540821	100.3
2000-01	59000	53748	91.1	57800	53137	91.9	638873	550997	86.2
2001-02	47000	46656	101.1	45630	49078	107.6	536006	517596	96.

Source :1. Health Administration Report: Health Service Department, Government of Kerala. Various issues.
2. Monthly bulletin on family welfare program, Health information cell, DHS, Trivandrum.
3. Facility survey RCH project for Kerala, Thrissur (1999), .Ministry of health and family welfare, Government of India.

Vitamin A

Deficiency of Vitamin A is a very common cause of preventable blindness in India. It particularly affects children between one and five years. It results from deficient intake of diet containing vitamin A like milk and milk

products. Vitamin A deficiency may occur in infants born to mother deficient in vitamin A. If pregnant women are given diet rich in vitamin A or B it will protect her baby from vitamin A deficiency for the first six months of life. Government of India has started a National Program for prevention of blindness due to vitamin A deficiency among children. Vitamin A dose in the form of tablets/liquids is given to children. The National Program on Prevention of Blindness targets children of age 1-5 years and oral dose of vitamin are administered to children every six months. This service is delivered through the sub centers of primary health centers and through Anganawadi centers where ICDS blocks exists. With regard to the achievement in vitamin A solution, it is seen from the Table 6.18 that in 1998-99, percentage of achievement in Palakkad exceeds the target rate but in the next year there has been a steady decline in the rate to 77.7 %. In 2000-01 the rate again increased to reach 93.2 in 2001-02. Thrissur, though had a lesser than the targeted rate in 1998-99, marked a steady decline in the rate till 2001 and in 2001-02 the rate again increased to 96.9 %. Thus, periods, 1999-2001 showed poor performance in both divisions, the rate improved in both divisions in 2001-02.

Table 6.18.

Vitamin A

Year	Thrissur			Palghat			State		
	Need	Ach	Per	Need	Ach	Per	Need	Ach	Per
1998-99	51612	48928	94.8	44922	47528	105.8	548715	509756	92.9
1999-00	52000	47264	90.9	52200	40567	77.7	539218	540821	100.3
2000-01	59000	49959	84.7	57800	47269	81.8	638873	502894	78.7
2001-02	47000	45529	96.9	45630	42527	93.2	536006	477124	89

Source: Monthly Bulletin on family welfare for March: various issues: Health information cell: Directorate of Health Services, Trivandrum

DT 5 Years

Instead of DPT, DT is given above the age of three years. In non immunized children, two dose of DT are given at an interval of four weeks. DT is given below three years in children prone to neurological complications or those who have history of pre existing neurological disorders.

It is seen that in terms of DT 5 years, Thrissur showed an outstanding performance in 1999-2000 by attaining 134 % of the target as against 95 % of attainment in Palakkad (Table 6.19). But, 2000-01, showed a steady decline to 91.2 % in Thrissur, while Palakkad showed better performance by attaining more than the targeted rate. Both divisions showed a decline in their performance in 2001-02 but the rate is above 90 % of the target.

Table 6.19.

DT 5years

Year	Thrissur			Palghat			State		
	Need	Ach	Per	Need	Ach	Per	Need	Ach	Per
1999-00	35500	47539	134	39100-	37199	95	449606	467215	104
2000-01	52000	47450	91.2	40800	39970	102.1	494837	470421	95.1
2001-02	49000	44807	91	41300	39517	95	495811	462061	93

Source: Monthly Bulletin on family welfare: various issues: Health information cell: Directorate of Health Services, Trivandrum

T T 10 years and TT 16 years.

Though percentage of achievement in TT 10 years was 81.5 % in Thrissur and 79.3 in Palakkad in 1999-2000, it increased to 102 % and 111 % in Thrissur and 103 and 96 % in Palakkad in the subsequent periods. With regard

to TT 16 years, Thrissur recorded a steady increase from 81.1 % to 123 %, though rate of achievement in Palakkad is declined to 67.5 % during the year 2000-01, far below the targeted level. Both divisions showed better performance in 2001-02 by attaining more than the target (Table 6.20 and 6.21).

Table 6.20.

TT 10 years

Year	Thrissur			Palakkaad			State		
	Need	Ach	Per	Need	Ach	Per	Need	Ach	Per
1999-00	59000	49111	81.5	44310	35135	79.3	498763	487773	87.7
2000-01	49000	50179	102.4	37300	38751	103.9	495336	508849	102.7
2001-02	42270	54848	111	49000	40793	96	529124	516685	97

Source: Monthly Bulletin on family Welfare: various issues: Health information cell: Directorate of Health Services Trivandrum

Table 6.21.

TT 16 years

Year	Thrissur			Palakkad			State		
	Need	Ach	Per	Need	Ach	Per	Need	Ach	Per
1999-00	61000	49394	81.0	48020	55997	116.6	485485	442881	91.1
2000-01	53000	52404	98.9	589000	39800	67.5	494024	484682	98.1
2001-02	47000	58101	123	413000	44085	106	513856	495873	96

Source: Monthly Bulletin on family Welfare: various issues: Health information cell: Directorate of Health Services, Trivandrum

6.3.5. IFA Pregnant Women and Prophylaxis against Nutritional Anemia

Nutritional anemia is mainly due to deficiency of iron, but can be due to deficiency of folic acid. It is a more common problem in women especially

during pregnancy. Folic acid containing 60 mgs of elemental iron and 0.5 mg folic acid is recommended during the last 100 days of pregnancy under the National Program for the prevention of anemia. In terms of IFA, Palakkad showed better performance than Thrissur by attaining more than the target (Table 6.22). But in terms of prophyliaxis against nutritional anemia Thrissur division had better performance than Palakkad division (Table 6.23).

Table 6.22.

IFA Pregnant Women 60mg Prophylactic

Year	Thrissur			Palakkad			State		
	Need	Ach	Per	Need	Ach	Per	Need	Ach	Per
1999-2000	50000	72946	145	40100	78894	196.7	537726	645385	114.4
2000-2001	75000	60113	80.1	81320	107464	132.1	566174	613179	108.3
2001-2002	40000	39120	98	50700	55954	110	592883	439649	74

Source: Monthly Bulletin on family Welfare: various issues: Health information cell: Directorate of Health Services, Trivandrum

Table 6.23.

Prophylaxis against Nutritional Anemia Blindness

Year	Thrissur			Palakkad			State		
	Need	Ach	Per	Need	Ach	Per	Need	Ach	Per
1999-2000	157500	144206	91.6	155250	127222	82	1552965	1486654	96.0
2000-01	156500	150355	96.1	153200	144644	94.1	164454	1437311	87.4
2001-02	134500	134402	99	143345	136158	94	1474201	1351329	92

Source: Monthly Bulletin on family welfare: various issues: Health information cell: Directorate of Health Services, Trivandrum

From the above analysis, it is clear that in terms of universal immunization program, both divisions showed significant achievements. By the end of March 2001, coverage at national level is 83.7 % for TT pregnant women about 82.9 % for BCG, 84 % for DPT, 92 .5 % for OPV[6]. Achievement of Thrissur and Palakkad is significantly higher than these rates.

Although the target was universal immunisatin by 1990, in practice, no country, even in the industrial world, has never achieved 100 % immunization in children. Universal immunization is therefore best interpreted as implying the ideal that no child should be denied immunization against tuberculosis, diphtheria, whooping cough, tetanus, polio and measles. It is however, generally agreed that when immunization coverage reaches a figure of 80 % or more, then disease transmission pattern are so severely disrupted as to provide a degree of protection even for the remaining children who have not been immunized because of the hard immunity.

6.4. Outcome Evaluation of preventive Measures

This section examines the impact of the family welfare program on the health status of people in Thrissur and Palakkad district. Indicators used for out come evaluation are those, which are commonly used for national and international comparison. Thus, fertility related statistics are used for evaluation of family planning program. Impact of maternal and child health program are examined by analyzing mortality, morbidity, growth and developments.

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[6] Department of Health and Family Welfare Government of India, 2001

6.4.1. Fertility Related Statistics

Fertility may be measured by a number of indicators as given below.

1. Crude Birth Rate

A widely used fertility measure is Crude Birth Rate (CBR), which is defined as the number of live births in a given period for a total population of one thousand.

$$CBR = \frac{\text{Number of live birth during the year} \times 1000}{\text{Estimated mid year population}}$$

CBR indicate the population change that result from family planning and has the advantage of being easy to calculate. The relevant data are furnished in Table 6.24.

Table 6.24.

Birth Rate

Year	Thrissur	Palakkad
1990	19.7	21.7
1991	19.35	19.94
1992	17.70	18.60
1998	15.53	18.49
1999	16.96	19.31
2000	17.05	17.01
2001	18.28	14.93
2002	16.10	15.7
2003	17.4	16.3

Source 1. Vital Statistics Bulletin 2000 Government of Kerala, Department of Economics and Statistics Trivandrum 2003
2. SRS of India Birth and Death Kerala. Government of Kerala Department of Economics and Statistics Trivandrum2002
3. VITAL statistics 1991. Annual Reports on Vital Events. Department of statistics Government of Kerala.
4. Directorate of Heaalth Service Trivandrum
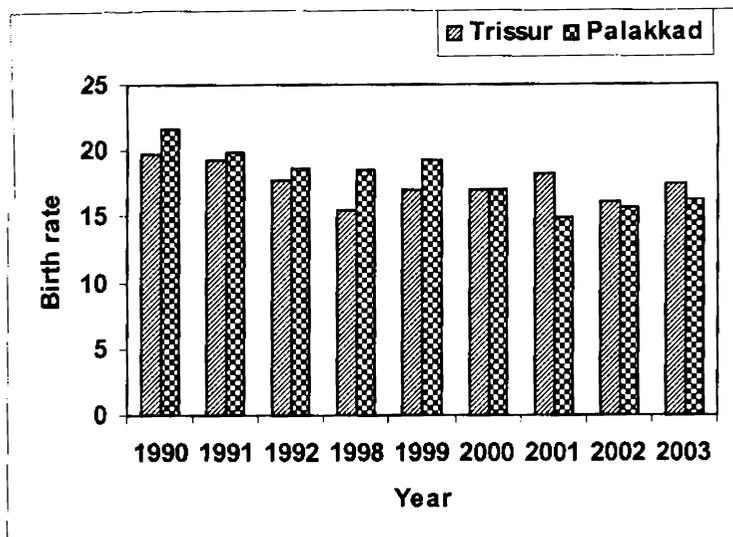
Figure 6.5. Comparison of Birth Rate in two Districts

It was apparent from the Table 6.24 that birth rate registered a steady declining from 19.7 to 17.05 and 21.7 to 17.01 in Thrissur and Palakkad respectively from the year 1990 to 2000. Though Palakkad started with a higher rate in 1990, it achieved a lower rate than Thrissur in 2000. But an increase was noticed in the year 2001 in Thrissur. It was striking to see that the birth rate attained in both Thrissur and Palakkad are lower than the targeted rate of 21 (for 2010) even at the beginning of 1990. This indicates a satisfactory performance of family planning program in this area in terms of birth rate.

2. Death Rate

Growth rate of population is a combined effect of birth and death rate. Though death rate is not a measure of fertility related indicator, it has an

important bearing on the growth rate of population. Hence, change in the death rate is also taken in to account.

Table 6.25.

Death Rate

Year	Thrissur	Palakkad
1990	5.6	5.59
1991	6.02	6.17
1992	6.19	5.18
1998	6.35	7.83
1999	7.10	6.58
2000	6.48	5.27
2001	6.1	5.8
2002	6.4	6.04
2003	6.2	6.1

Source   1. Vital Statistics Bulletin 2000 Government of Kerala
Department of Economics and Statistics Trivandrum 2003
2. SRS of India Birth and Death Kerala. Government of   Kerala
Department of Economics and Statistics Trivandrum2002
3. VITAL statistics 1991. Annual Reports on Vital Events.
Department of statistics Government of Kerala.
4. Directorate of Heaalth Service Trivandrum
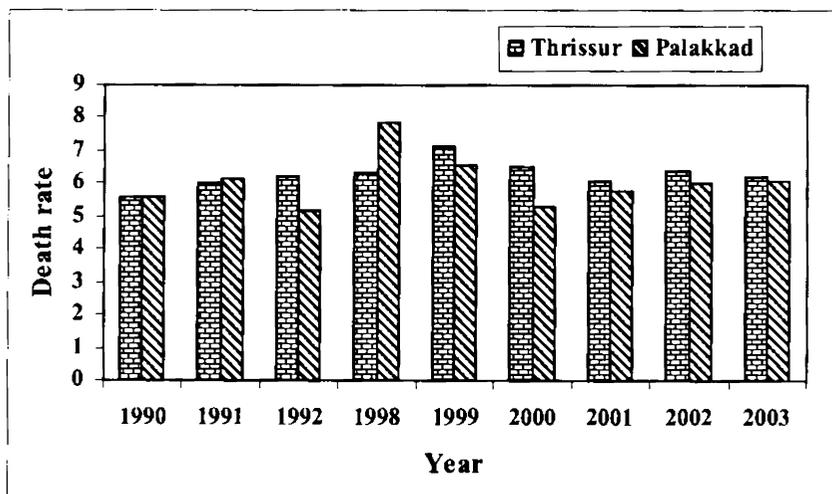
Figure 6.6. Comparison of Death Rate of two Districts

187

With regard to the death rate also, performance of both areas are impressive. As is mentioned earlier, among the health indicators, Kerala's achievement in terms of death rate is remarkable by surpassing even the rates of highly advanced countries like UK and USA. A comparative analysis of death rate of these two areas from 1999 to 2000 shows that the death rate which was 5.6 in 1990, for Thrissur shows a steady rise till 1999 to reach a rate of 7.10 and in 2000 a marginal decline to 6.48. As against this, in Palakkad, though the rate gone up to 7.83 in 1998, it declined to 5.27 in 2000, a rate lower than the rate of 1990 (Table 6.25). Thus, in terms of death rate Palakkad showed better performance than Thrissur. However, it is noted that, in 1999 and 2000, both birth rate and death rate shows marginal increase in Thrissur. But in 1998, birth rate and death rate was higher in Palakkad.

Demographers opine that further rapid decline in death rate may not be continued in future. The reason is that most of the 'easy' conquest of mortality has been accomplished through the widespread use of vaccines, antibiotics, insecticides, and other life saving measures. The tasks that remain now are the most difficult one such as improvements in environmental sanitation and nutrition, and control of non- communicable and genetic diseases. Though in terms of birth rate these two areas attained the target set for 2010 by 1990 itself, it is doubtful whether Kerala can attain the targeted goal of death rate of 5 per 1000 by 2010 if the present state continues.

3 General Fertility Rate

General fertility rate (GFR) is the number of live births per thousand women in the reproductive age group (15-45 years) in a given year.

$$GFR = \frac{\text{Number of live births in an area during the year} \times 1000}{\text{Mid year female population age (15 - 44) in the same year}}$$

General fertility rate is a better measure of fertility than the crude birth rate because the denominator is restricted to the number of women in the child bearing age, rather than the whole population. The major weakness of this rate is that not all women in the denominator are exposed to the risk of children.

With regard to the GFR, Kerala has recorded the lowest rate among the states (Annexure 6.2). GFR in Kerala is estimated as 61.7, as against the national average of 112.5. Our neighboring states Tamil Nadu, Karnataka and Andra Pradesh, with a GFR of 70.4, 87.4, and 88.9 stands behind Kerala, though in per capita income terms, they stands ahead[7]. It is surprising to see that GFR in Thrissur recorded 57.1, which is lower than the State average, where as palakkad showed a higher rate (66.87) than Thrissur and State average.

4. Total Fertility Rate (TFR)

Crude birth rate has the advantage of being easy to calculate but is inadequate for depicting underlying fertility pattern associated with the age of women. Hence, more sophisticated measure namely TFR is used for evaluation. The Total Fertility Rates (TFR) is an age-adjusted measure that represents the total number of children a woman would have born during her reproductive span. This measure gives the approximate magnitude of completed family size.

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[7] Women in Kerala 2001 Government of Kerala.

It is note worthy that Kerala has been able to achieve total fertility rate of 2.1 even before the couple protection rate of 60 has been achieved and that the cost of family welfare program per eligible couple in this State is relatively low. Kerala, the first State to achieve TFR of 2.1 did so in spite of relatively low per capita income where as in spite of having substantially higher per capita income Punjab and Haryana are yet to achieve TFR of 2.1.[8] The State average of TFR is 0.86, where as Thrissur and Palakkad recorded a slightly higher rate of 1.75 and 1.78 respectively. This rate is significantly lower than the ninth plan goal of 2.6 and National population policy goal of 2.1. Thus, achievement of these two areas in terms of GFR and TFR is remarkable.

5. Age specified fertility rate

Age specified fertility rate is the number of live births in a year to 1000 married women in any specified age group.

$$\text{ASFR} = \frac{\text{Number of live births in a particular age group} \times 1000}{\text{Mid - year female population of the same age group}}$$

It is a well known biological fact that fertility increases up to a certain age and starts to decline. An estimation of this trend is found in the age specific fertility rate. The age specific fertility rate increases steeply in the early years and then begins to fall usually in the 20-25 age group and decline sharply in the late 30s age group. This suggests a pattern of early child bearing which is consistent in rural India. In spite of differentials in fertility, the fertility schedule (slope) is similar in almost all States as is the trend for rural India. The levels of age specific fertility rate are lower in Kerala and Haryana.

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[8] 9th plan document, 1997-2002

Table 6.26.

Age Specific Fertility Rate

District/	Age group						
State	15-19	20-25	25-30	30-35	35-40	40-45	45-50
Thrissur	13.15	140.43	142.15	41.53	10.21	00	2.01
Palakkd	44.64	171.29	207.56	38.29	12.04	1.59	00
State	24.46	141.85	129.25	49.43	11.39	2.27	0.18

Source: SRS 1999
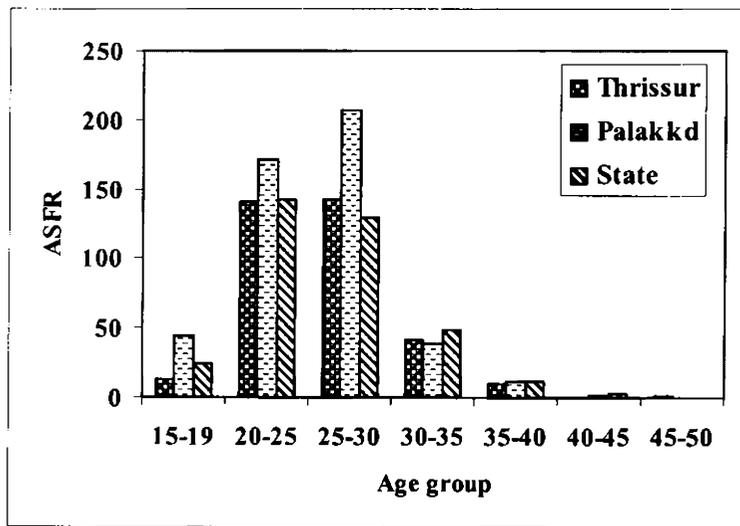
Figure 6.7. Comparison of Age Specific Fertility Rate (ASFR) in two District and State Average

ASFR in Thrissur is lower than the State average at the age group 15-19 and 20-25; where as ASFR in Palakkad is higher than the State average for the same age group (Table 6.26). Again, ASFR at age group 25-30 in Thrissur is higher than the State average and in Palakkad is lower than the State average. This shows that age at the time of delivery and marriages takes at higher age in Thrissur and lower age in Palakkad.

6. Couple protection rate

Couple protection rate (CPR) is an indicator of the prevalence of contraceptive practice in the community. It is defined as the percentage of eligible couple effectively protected against child birth by one or the other approved methods of family planning via sterilization, IUD, condom or oral pills. Couple protection rate refers to percentage of currently married women at age 15-44 years using any modern methods of contraception. Demographers are of the opinion that the demographic goal of net reproduction can be achieved only if the CPR exceeds 60. Ninth plan goal and National population policy 2001 is to attain CPR of 60. With regard to CPR, it was seen that Kerala could not attain the target and/or National population policy of meeting all needs. CPR attained in Kerala recorded 65.8 while Thrissur and Palakkad attained 68.1 and 61.8 respectively in 2004[9] (Annexure 6.3). In terms of CPR, both divisions couldn't attain the target but could reduce the TFR to less than two. CPR of Thrissur division stands closer to the national goal [10].

CPR is based on the observation that 50 to 60 per cent of birth in a year is of birth order 3 or more. Thus, attaining a 60 % CPR will be equivalent to cutting off almost all-third or higher order births, leaving 2 or less surviving children per couple. Therefore, the previous national policy was to attain a CPR of 42 % by 1990 and 60 % by the year 2000. In short, CPR is a dominant factor in the reduction of net reproduction rate. A State wise break up of CPR is given in Annexure 6.4.

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[9] Kerala Economic Review 2004. Government of Kerala.
[10] Health Monitor 2003-FRHS).

7. Felt needs

The concept that eventually became unmet need for family planning was first explored in 1960s when data from surveys of contraceptive Knowledge Attitude and Practice (KAP) showed a gap between some women's reproductive intension and their contraceptive behavior. The term that came to popular use describing this group was "KAP GAP". One of the first published use of the term "unmet needs" appeared in 1977. In 1978, based on world Fertility Survey dated from five Asian countries, Charles West off published first comparative estimate of unmet need for limiting births. Unmet needs for family planning refers to currently married woman age 15-44 years having unmet need for family planning. Many women who are sexually active would prefer to avoid becoming pregnant but nevertheless are not using any method of contraception. These women are considered to have an unmet need for family planning. According to National Family Health survey, 2-(1998), about 16 % of currently married women in India have an unmet need for family planning. Although current use of contraception has increased and though the extent of current need has declined in most of the states in India, there is a need for considerable improvement in the coverage and quality of family planning services. In terms of unmet needs, Palakkad shows better performance with 11.7 %, while Thrissur shows 12.4 % and State average is 15.2. But both the district showed a better performance than State average.

6.4.2. Outcome Evaluation of Maternal and Child health Care Program

Following indicators are used for the out come evaluation of maternal and child health program.

1. Infant mortality rate

Infant Mortality Rate (IMR) is usually regarded not only as a most important indicator of health status of a community but also of the level of living of people in general, and effectiveness of MCH services in particular. Infant mortality is given a separate treatment by demographers because, (a) infant mortality is the largest single age-category of mortality, (b) deaths at this age are due to a peculiar set of diseases and conditions to which the adult population is less exposed or less vulnerable and (c) Infant mortality is affected rather quickly and directly by specific health programs and hence may change more rapidly than the genera death rate.

The term 'IMR" refers to the mortality among children of less than one year of age. All children under one year of age are, therefore, considered as infants. Since, infants, more than any other section of population depends, to a large extent, upon the environmental condition for survival.The death of an infant, in most cases, is due to the poor and unsanitary environment. Infant mortality rate, is, therefore, taken as a reliable and sensitive index of the total health condition of a community or a country. The conventional IMR is defined as the number of infant death that occur during a given period of time, usually calendar year per 1000 birth during the same period in a given population. The IMR does not take into account, either fetal death or still birth, but only live birth and infant deaths. So, an infant death is the death of any life born child before it complete the first year of life. Conventionally, Still birth and fetal deaths are not treated as a part of IMR.

IMR reflects the socio economic development of a country. Deaths during the first four weeks are largely preventable by good health care. Much of the variations between developed and developing world in death among new born can be explained by differences in antenatal care. The other major factors being malnutrition, low birth weight of the baby and congenital anomalies.

In the industrialized world, the dominant factor in the decline of IMR was economic and social progress, with medical services playing secondary role. On the other hand, in most of the developing countries, this pattern has been almost turned upside down. That is, medical services have made the major impact, with social and economic progress taking the supporting role. Therefore, IMR are reluctant to fall below 100 per 1000 live birth in many developing countries. It is now concede that only socio economic development can reaccelerate the progress and lead to further significant fall in IMR.

Infant mortality rate is defined as the ratio of the infant death to total live birth in a year.

$$IMR = \frac{\text{Number of deaths under one year of age x 1000}}{\text{Total live birth in the year}}$$

Available data on infant mortality rate, in Thrissur and Palakkad, shows that the rate attained in these two areas are significantly lower than the targeted rate for 2010 i.e. less than 30 per 1000. Comparative analysis between these two areas shows that by 2000, IMR declined to 6.5 in Palakkad, though started with a higher rate than Thrissur. Highest rate of IMR was recorded in 1998 in Palakkad. In 1998 and 1999, IMR was significantly higher in Palakkad than Thrissur. IMR in Thrissur was 11.92 in 1990, reached to 13.39 in 1998 and 15.37 in 1999. Though it declined to 9.86 in 2000, it again increased to 12.9 in

2001. In terms of infant mortality rate, achievement of Palakkad is better than Thrissur, except in the year 1998 and 1999 (Table 6.27).

Table 6.28.

IMR

Year	IMR (Thrissur)	IMR (Palakkad)
1990	11.92	12.23
1991	11.74	10.18
1992	11.26	7.41
1998	13.39	19.14
1999	15.37	16.63
2000	9.86	6.51
2001	12.9	10.5
2002	11.9	10.8
2003	12.2	12.1

Source 1. Vital Statistics Bulletin 2000 Government of Kerala   Department of Economics and Statistics Trivandrum 2003
2. SRS of India Birth and Death Kerala. Government of   Kerala Department of Economics and Statistics Trivandrum2002
3. VITAL statistics 1991. Annual Reports on Vital Events. Department of statistics Government of Kerala.
4. Directorate of Heaalth Service Trivandrum
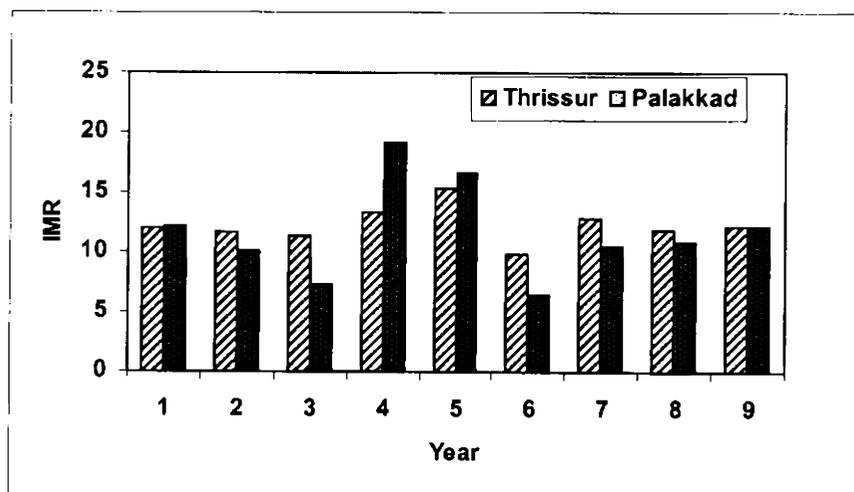
Figure 6.8. Infant Mortality Rate in Thrissur and Palakkad

It is striking to see that in developed countries IMR varied between 3 and 6, which is lower than the death rate. Reverse is the case in Kerala as seen in developing countries. Compared to the general mortality rate, IMR is higher in the study areas though in relation to our neighboring States our achievement is striking. Break up of IMR into neo natal perinatal and post neonatal mortality are examined to get the components of IMR.

2. Perinatal Mortality

With the decline of IMR to low levels in many developed countries, perinatal mortality has assumed greater significance as a yardstick of obstetric and pediatric care before and around the time of birth. Perinatal Mortality Rate (PMR) includes both late fetal death (still birth) and early neo natal deaths. The eighth revision of the International Classification of Diseases (ICD) defined the perinatal period as lasting from the 28th week of gestation to the seventh day after birth.

The WHO's definition, more appropriate in nations with less well established vital records of still births is as follows:

$$PMR = \frac{\left[\begin{array}{l}\text{Late fetal deaths (28 weeks gestation and more)} + \\ \text{early neonatal death (first week) in one year}\end{array}\right] \times 1000}{\text{No. of live birth in the same the year}}$$

For international comparison, WHO Expert Committee on the prevention of perinatal mortality and morbidity (1970) recommended more precise formula for late foetal and early neonatal deaths weighing over 1000gm at birth expressed as a ratio per 1000 live birth weighing over 1000gm at birth. PMR is estimated in this study by using the following formula

197

$$PMR = \frac{\text{No. of still birth + death of infants} < 7 \text{ days during one year x 1000}}{\text{No. of live birth and still birth during the year}}$$

Peri natal mortality is a problem of serious dimensions in all countries. It now accounts for about 90% of all foetal and infant mortality in the developed countries. In India, still birth is seldom recorded. Consequently, most studies on peri natal mortality in this country are hospital based.

Our study reveals that, in Thrissur around 75 % of the total infant deaths occur with in one month and in Palakkad it is surprising to see that all the infant deaths in 1999-2000 are with in one month (Annexure 6.5 and 6.6). Since then, With regard to PMR, Palakkad lag behind Thrissur. The advances Thrissur District made in this respect is comparable to that of highly rich countries like Japan, Switzewrland and even out passes UK and USA in terms of these rates (Table 6.28).

3. Neo natal mortality

Neo natal deaths are deaths occurring during the neonatal period, commencing at birth. Neonatal Mortality Rate (NMR), is the number of neonatal deaths in a given year, per 100 live births in that year.

$$NMR = \frac{\text{Number of deaths of children under 28 days of age in a year x 1000}}{\text{Total live birth in the same year}}$$

Low birth is considered as one of the reasons for neo natal mortality. Neonatal mortality is a measure of the intensity with which 'endogenous factors (low birth weight, injuries) affect infant life. The neonatal mortality is

198

directly related to the birth weight. The high concentration of infant death in the early neonatal period with endogenous causes suggests the need to improve the antenatal and postnatal services to expectant mothers. However, neonatal mortality is the most difficult part of the infant mortality to alter, because of the endogenous factors, which are not sensitive to improvement in environmental conditions.

4. Post neo natal mortality

Deaths occurring from 28 days of life to less than one year are called post neo natal mortality. The post neonatal death rate is defined as "the ratio of post neonatal deaths in a given year to the total number of live births in the same year, usually expressed as a rate per 1000.

$$PNMR = \frac{\left[\begin{array}{l} \text{Number of deaths of children between 28 days} \\ \text{and one year of age in a year} \end{array}\right] \times 1000}{\text{Total live birth in the same year}}$$

Where as neonatal mortality is dominated by endogenous factors, post neonatal mortality is dominated by exogenous factors (environmental and social factors). Diarrhea and respiratory infections are the main causes of death during the post neo natal period. Malnutrition is an additional factor, reinforcing the adverse effect of the infection.

Prenatal mortality, neonatal mortality and post neo natal mortality are lower in Thrissur compared to Palakkad. The rate attained in Thrissur is lower than the rate of UK and USA and stands close to the rate of Japan and

Singapore[11]. Peri natal mortality is 10 per 1000 in UK and USA and 5 for Japan and Singapore.1995) Neonatal mortality rate was estimated as varying from 53 for the least developed countries to 5 per 1000 live birth for developed countries. In India, 55 to 60 % of infant deaths occur with in neonatal period. Of these more than half may die during the first week of birth. It is striking to see that neonatal death in Thrissur is lower than the average rate of highly developed countries. The rate attained in Palakkad is a little higher than Thrissur, but, stands close to the rate of highly developed countries. In India, post neo natal mortality rate is estimated to be 27.5 in rural and 19.6 for urban[12] .Post neonatal mortality rate attained in the study areas is significantly lower than national level and state level. Thus, in terms of PMR, NMR, PNMR, both divisions attained signal achievements, though Thrissur stands ahead of Palakkad.

Table 6.28.

Peri natal Mortality, Neonatal Mortality and Post Neonatal Mortality (Rates) Thrissur

Year	PMR	NMR	PNMR
2000	6	3	0.8
2001	6	3	0.7
2002	5	2	0.4
2003	7	5	1.3

Source: Calculated from secondary data, DHS

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[11] WHO1996. The World Health Report 1996 Report of Director General
[12] Govt; of India 1998- health information of India, 1995-96 Ministry of health and family welfare New Delhi
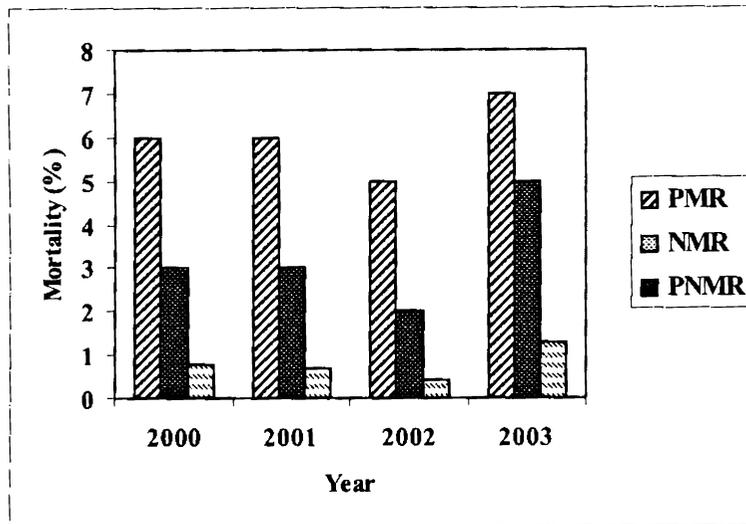
Figure 6.9. Peri natal Mortality, Neonatal Mortality and Post Neonatal Mortality (Rates) - THRISSUR

Table 6.29.

Peri natal Mortality, Neonatal Mortality and Post Neo natal

Mortality Rates) Palakkad

Year	PMR	NMR	PNMR
2000	12	8	0
2001	12	5	2
2002	8	4	1
2003	14	4	3

Source: Monthly Bulletin on Family Welfare DHS

Percentage of neonatal death to total infant death is higher in both divisions. If it is possible to reduce this rate then our IMR will stand closer to the level of developed countries.
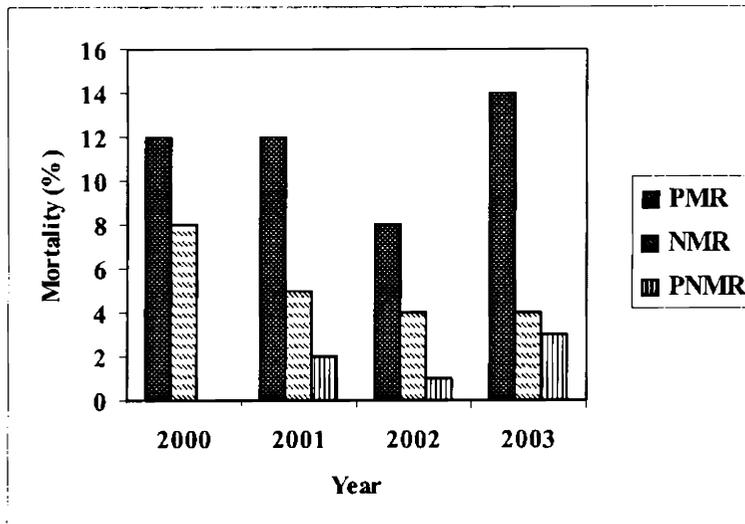
Figure 6.10. Peri natal Mortality, Neonatal Mortality and Post Neo natal Mortality (Rates) - Palakkad

5. Still Birth Rates

The most widespread use of the term 'still birth' is death of a fetus weighing 1000 gm or more occurring during one year in every 1000 total births. Still birth is given by the formula,

$$\text{Still Birth} = \frac{\text{Fetal deaths weighing over 1000gm at birth}}{\text{Total live birth} + \text{Still birth}}$$

It is a frequent occurrence in the developing countries. Its prevention involves the detection and treatment in the course of pregnancy as well as of high blood pressure and its complications, diabetes and premature rupture of membranes.

During the year 1999, the still birth rate in India was 7.3 in rural areas, 5.2 in urban areas, and 8.9 for the total country (Health monitor, 2003). Though Palakkad recorded a low rate in terms of still birth rate, it shows an increasing

trend, to reach a rate of 10 per thousand from 3.91, as against a steady decline in Thrissur from 6.04 to 4 per thousand (Table 6.30).

Still birth rate of Palakkad in 2003 is estimated to be higher than the National average of 9 and State average of 6. Number of still birth rate in Palakkad increased from 3.91 per 1000 in 1990 to 9.49 in 1998. In 1999 it went down to 2.27 then an increase was observed and reached to 10 in 2003. But in Thrissur the rate declined from 6 per 1000 to 4.

Table 6. 30.

Still Birth Rate in Thrissur and Palakkad

Year	THRISSUR	PALAKKAD
1990	6.04	3.91
1991	6.33	5.77
1992	6.92	4.26
1998	0.00	9.49
1999	0.00	2.27
2000	3.69	7.31
2001	4	8
2002	4	5
2003	4	10

Source: 1. 1999-2000 SRS

2. 2000-2003 DHS Trivandrum
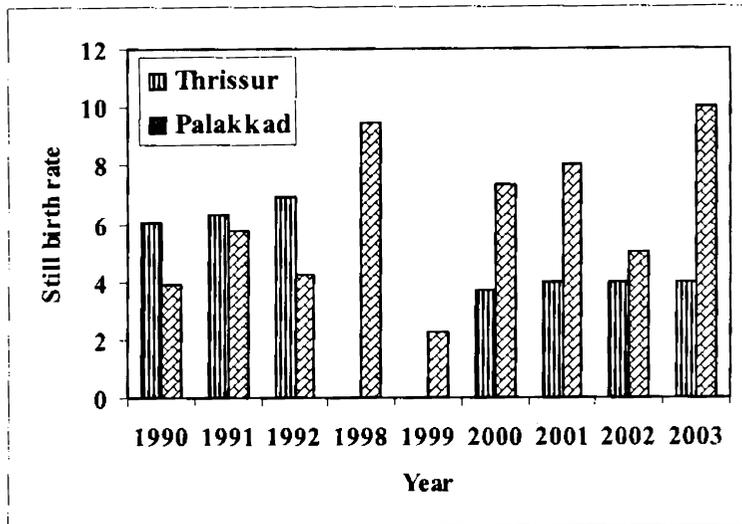
Figure 6.11. Still Birth Rate in Two Districts

From the figure it is clear that still birth rate is higher in Thrissur in the initial year. But 2000 onwards, higher still birth was observed in Palakkad.

6. Low Birth Weight Babies

Birth weight is a major determinant of infant and peri natal mortality and morbidity. One major cause of low birth weight is poor malnutrition not only during pregnancy, but also even before that. It has been observed that mother who was adequately nourished during her own growing up years has an excellent chance of delivering a normal sized baby even if she has taken an inadequate diet during her pregnancy. For the evaluation of adequate supply of food and nutrition, proportion of low birth weight babies is taken into account.

The birth weight of an infant is the single most important determinant of its chances of survival, healthy growth and development. A target birth weight of at least 2.5 kg for 90 % of newborn infants, and an adequate growth of children

constitute global indicator number 8 for monitoring and evaluation of the global strategy for 'Health For All 2000'. By international agreement, low birth weight has been defined as birth weight of less than 2.5 kg, the measurement being taken preferably with in the first hour of life, before significant postnatal weight loss has occurred.

WHO estimates that globally about 25 million low birth weight babies are born each year, consisting 17 % of all live births, nearly 95 % of them in developing countries. Infants who weigh less than 2.5 kg at birth represent about 26% of all live births in India. The Government of India wished to control this problem and decrease the incidence to 10 % by the year 2000 along with the strategies that had been developed to achieve 'Health For All' by the year 2000. As birth weight is conditioned by the health and nutritional status of mothers, the percentage of infants born with a low birth weight closely reflects the health status of the communities in which they are born. In most parts of India, the mean birth weight is between 2.74 and 2.9 kg[13].

Table 6.32.

Percentage of Low Birth Weight Babies

Year	Thrissur	Palakkad
1998 - 1999	13.2	16.1
1999 - 2000	17.0	12
2000 - 2001	23.0	14
2001-02	16	18
2002-03	18	18

Source: 1998-99 economic review Kerala 2000

1999-2003–DHS Trivandrum

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[13] (Sahanti Ghosh 1996- 'The feeding care of infants and young children' Health education in South East Asia, UNICEF New Delhi).

Percentage of low birth weight babies in Thrissur and Palakkad is estimated as 13.2 and 16.1 respectively in 1998-99 (Table 6.31). This is higher than the internationally accepted level of 10 %. Again, the rate declined to 12 % in Palakkad, in 1999-2000. But, the rate in Thrissur hiked to 17 % in 1999-2000 and then to 23% in 2000- 2001. This shows that what we have attained in terms of mortality indicators cannot be attained in terms of nutritional status. Percentage of low birth babies in developed countries is estimated as varying from 6 to 8 and for less developed countries from 20 to 30 (Annexure 6.7). In terms of nutritional status our achievement is not satisfactory.

6.5. Promotive measures

6.5.1 Access to Safe Drinking Water and Sanitation: Kodungallur and Chittur

Primary data was collected from the rural population of Chittur and Kodungallr block to examine the availability, sources and quality of water. Regarding the sources of water supply, it is seen from the Table 6.32, that 34 % of households in Kodungallur and 89 % of households in Chittur, depend on well water. Well water is the major source of water for people in Chittur block. At the same time, 51 % of households in Kodungallur use pipe water as against 9 % in Chittur. For about 64 % of the households in Chittur, main source of drinking water is others well while in Kodungallur, only 5 % depend on others well. It is striking to note that, no one in Chittur block have own pipe line connection, though in Kodngallur, 26 % have this facility. Twenty five percentage of the households in Kodungallur have public tap facility as against 9 % in Chittur. 15 % of households in Kodungallur uses filter tank facility

where as in Chittur, such facility is not seen and 1 % uses bore well. Since, Kodungallur is a coastal area, wells cannot be dug deep because, and then, the water available will be saline. Bore wells cannot be constructed as the water supplied will be saline in that area and it is advised by the water authority not to dig bore wells in Kodungallur block. This may be the reason for higher rate of dependence on pipe water by the people in Kodungallur.

Table 6. 32.

Source of Drinking Water

Kodngallur				Chittur		
Sources	No:	%		Sources	No:	%
Own well	43	29		Own well	38	25
Others well	8	5		Others well	96	64
Pipeline	39	26		Pubic tap	14	9
Filter tank	23	15		Bore well	2	1
Public tap	37	25		-	-	-

Source: primary data

Regularity of water supply

Regarding the regularity of water supply, 60 % in Chittur reported supply of water as regular, while only 20 % has regular supply of water in Kodungallur Since nearly 90 % of people in Chittur depend on well water; they do not pose any problem in case of supply of water (Table 6.33). Only during extreme summer they face shortage of water. But in Kodungallur 80 % of the respondents reported irregular water supply. This may be due to higher dependence of people in Kodungallur on pipe water. According to them, supply of water in this area is always erratic. Chi square statistics computed for testing

the dependency of regularity of water supply on the district was found to be significant. This indicates that regularity of water supply depends on the district. As Kodungallur needs more water from the pipe, regularity of water supply is reported to be more in Chittur than in Kodungallur.

Table 6.33.

Regularity of Water Supply

Kodungallur			Chittur		
Regularity	No:	%	Regularity	No:	%
Regular	30	20	Regular	90	60
Irregular	120	80	Irregular	60	40
Total	150	100	Total	150	100

Source; primary data Chi square=14.29

Quality of water

It is striking to note that 70 % of households in Kodungallur were not satisfied regarding the quality of water where as 80 % of the households in Chittur showed complete satisfaction (Table 6.34). Over exploitation of water by the Coca-Cola plant in Plachimada in Vandithavalam in Perumatty village was reported by the people to be the reason for scarcity and poor quality of water in Chittur block. It is reported that some people near the plant is digging bore wells in their compounds and is supplying water to the plant in addition to the over exploitation of water resources by the plant itself. Since majority of people in this area depends on well water than tap water, immediate government intervention to control this illegal action is needed to ensure proper water supply in this area in the coming future also. There is a common complaint among the people using tap water, that water supplied by the

authority is either over chlorinated or non-treated or polluted river water. People are reluctant to take tap connections, as water supply is erratic. Again, during the period of summer, when water is required at the most, the water supplied by the authority will be very scarce.

Table 6.34.

Quality of Water

Kodungallur			Chittur		
Quality of water	No:	%	Quality of water	No:	%
Satisfied	45	30	Satisfied	120	80
Not satisfied	105	70	Not satisfied	30	20
Total	150	100	Total	150	100

Source: primary data

6.5.2 Sanitation: Access to Toilet Facilities

Access to sanitation facilities in Kodungallur and Chittur

With regard to sanitation in Kodungallur and Chittur, it is seen that, though septic tank system is introduced in the villages, it has not made much headway in Chittur. As a result, 85 % of the respondents in Chittur did not have access to a latrine (Table 6.35). It is seen that, there exist striking difference between Thrissur and Palakkad with reference to access to toilet facilities. In Kodungallur, 91 % have access to toilet facilities i.e. they use septic tank (Table 6.36). More than 60 % even from among the lower income strata use septic tank and 100 % among middle income and higher income strata in Kodungallur

division. As against this, in Chittur division, only 15 % have access to toilet facilities. More than 60 % even from among the higher income group use open ground for defecation is really surprising in Chittur division. It is seen from the above that, income is not a major determinant of type of defecation. Thus, it is seen that, with regard to sanitation, most people in the village in Chittur, use primitive sanitary condition. Though septic tank system is introduced in this block, it has not made much headway. As a result, more than 80 % of the rural households did not to have access to latrine.

Table 6.35.

Access to Sanitation

Kodungallur

Type of sanitation	SES1		SES2		SES3		TOTAL	
Open Ground	8	(24)	-		-		8	(6)
Septic tank	21	(62)	71	(100)	45	(100)	137	(91)
OWN compound	5	(14)	-		-		5	(3)
Total	34		71		45		150	

Source: primary data

Table 6.36.

Access to Sanitation

Chittur

Type of sanitation	SES1		SES2		SES3		TOTAL	
Open Ground	46	(88)	52	(68)	14	(64)	112	(75)
Septic tank	2	(4)	12	(16)	8	(36)	22	(15)
OWN Compound	4	(8)	12	(16)	-		16	(10)
Total	52		76		22		150	

Source: Primary data.

Chi Square was employed to test whether there is any significant difference in the type of sanitation between the Districts. Chi square value computed was 179.07, which is greater than table value at 2 degrees of freedom (5.99). So, we reject the null hypothesis and conclude that there is significant difference in the use of type of sanitation between Districts. This shows that income is not a major factor in determining the type of sanitation. This shows the need for health education at the primary health care level among the people to change the toilet habits.

Summary

With regard to the performance of the family planning and the Maternal and child health care, both divisions recoded satisfactory level of achievement by exceeding the target in most of the years. Sterilization seems to be the most popular method in both divisions. Percentage of achievement is higher than Palakkad in Thrissur. More than 90 % of the achievement was recorded in both the divisions. Break up of sterilization into tubectomy and vasectomy showed one sided (female) participation in sterilization. In spite of low risk, negligible male participation rate is an indication of male domination. Technique wise break up of female sterilization showed that PPS is the popular method in both divisions. IUD and OP had not shown much acceptance among the people in both the divisions. Both divisions recorded signal achievement in terms of Maternal and Child care program also. Achievement of Thrissur and Palakkad in terms of Maternal and child Care is higher than the state average and the rate recommended by WHO.

Evaluation of the impact of family welfare Programs in terms of fertility indicators, mortality indicators are worked out in out come evaluation. Birth

rate attained in Thrissur and Palakkad is lower than the targeted rate of 2010 even at the beginning of 1990. This indicates a satisfactory performance of family planning program in these divisions. Comparative analysis of death rate in these divisions indicates that, Palakkad division showed better performance than Thrissur. Thrissur showed a steady rise in death rate from 1990 to 1999. In terms of death rate it seems doubtful whether these areas could attain the targeted rate set for 2010 if the present trend continues in the future. This point out the need for prioritization of environmental sanitation and development related issues such as accidents, suicides, stress and strains of modern life etc. In terms of GFR, TFR and CPR, both the divisions attained remarkable progress. It was seen that age at the time of marriage and delivery takes at higher age in Thrissur and at lower age in Palakkad. Both divisions recorded lower rate of unmet needs though Palakkad stands ahead of Thrissur.

Available data on IMR in Thrissur and Palakkad showed that the rate attained in these two areas are significantly lower than the targeted rate for 2010 i.e. less than 30 per thousand. Period 1998-99 recorded highest rate in both divisions. Compared to general mortality rate, IMR is significantly higher in these divisions though reverse is the case in developed regions. It is inferred that in terms of achievement of IMR, Kerala needs much to be desired. Desegregation of infant death into neonatal, peri natal and post neo natal death showed that percentage of neonatal death to total infant death is higher in both divisions indicating the need for prioritization of endogenous factors to reduce the IMR to the levels of developed countries. Still birth rate also recorded higher rate than the WHO norms in these divisions. It was surprising to see that as against the significant achievement in terms of survival norms, percentage of low birth weight babies recorded higher rate in these divisions.

Foregoing analysis on promotive measures showed that major source of water in Kodungallur is tap water whereas well water is the major source in Chittur. This is reflected in the responses of the sample households regarding the regularity of water supply. Eighty percentage in Kodungallur responded irregularity of water supply and 70 % were not satisfied with the quality of water supply. While in Chittur, 60 % responded regularity of water supply and 80 % were satisfied with the quality of water in Chittur. Chi square value estimated shows that regularity of water depends on the area. With regard to sanitation, Kodungallur stands ahead of Chittur. Ninety one percentage of the sample units in Kodungallur have septic tank facilities where as in Chittur, only 15 % have toilet facilities. More than 60 % even among the higher income uses open ground in Chittur. It was seen that the type of sanitation used by the people is associated with the areas and independent of their socio economic groups.

CHAPTER 7

ANALYSIS OF CURATIVE SERVICES OF PRIMARY HEALTH CARE SYSTEM

The provision of health care services provided by the primary health care system is meant to improve the level of health of the community and the quality of life[1]. The level of health of rural areas can be expressed through the measurement of disease. Data relating to the nature and extent of disease are termed as morbidity. Morbidity has been defined as any departure, subjective or objective from a state of psychological well being[2].

Comprehensive and reliable official data on morbidity in Kerala are not available at present. The only published source of data is on the disease of patients treated in government allopathic institutions. Needless to say, being limited to those who resort to these institutions, it touches only the tip of the iceberg. Further, the data are insufficient to make an assessment of either the incidence rate or prevalence rate. The reliability of the published data also leaves very much to be desired. Under these circumstances the only option is to go to the primary source of official statistics, i.e. the hospital records and survey data.

Part one of the Present chapter reveals morbidity profile of the patients treated in the government allopathic medical institutions in Thrissur and Palakkad Districts which is collected from the District Medical Office, Thrissur and Palakkad. Morbidity profile of two blocks, Kodungallur and Chittur are discussed in the second part, using the data collected from the records of

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[1]   Quality of life means satisfaction of inclusive set of human needs.
[2]   WHO (1959): Tech: Report Ser: No: 164

Primary health centers of the two blocks with limited facilities for inpatients each one belonging to Thrissur and Palakkad, Third part is intended to analyse the data collected from two private institutions one from Thrissur and other from Palakkad. These are the institutions for which the rural population approach for prompt and immediate relief and the information collected from these centers can be expected to yield a general picture of the common illness experienced by the rural population. Final section examines the primary data related to the disease profile of the study area.

7.1. Analysis of Curative Services of Government Allopathic Institutions

The information gathered from the District Medical Office is discussed in this section. To examine the working of curative measures, disease profile i.e. morbidity data of the two districts have been collected from the records of District Medical Office Thrissur and Palakkad for a period of 12 years from 1991. This data includes only patients treated in the government allopathic institutions. However, this data expected to give the trend and nature of disease in these areas.

7.1.1. Total Morbidity

Table 7.1 gives the available data on total number of patients treated for various diseases from 1991 to 2002. It is seen from the table that total number of patients treated have registered a two-fold increase in Thrissur and four-fold in Palakkad, during the period under study. Number of patients treated in Palakkad was less than that of Thrissur and growth index was less than 100 till 1997. But

since 1998 total number of patients in Palakkad exceeded its counter part in Thrissur and the period 1999-2002 showed more than four fold increase in total morbidity. Thus, total morbidity in Thrissur and Palakkad had increased during the period under study. The rate of increase is higher in Palakkad than in Thrissur.

Table 7.1.

Total Number of Patients Treated in Government Allopathic Institutions

Year	Thrissur		Palakkad	
	Total patients treated	Index	Total patients treated	Index
1991	1312157	100	788470	100
1992	3110215	237	677251	86
1993	1401730	107	562421	71
1994	1850709	141	619096	79
1995	1982710	141	778940	99
1996	2035185	155	625337	79
1997	2019106	153	895092	114
1998	1990412	152	3044686	386
1999	1778791	136	3616944	458
2000	2008392	153	2793303	354
2001	1877132	143	2241268	284
2002	2843698	216	3541117	449

Source: District Medical Office, Thrissur and Palakkad.
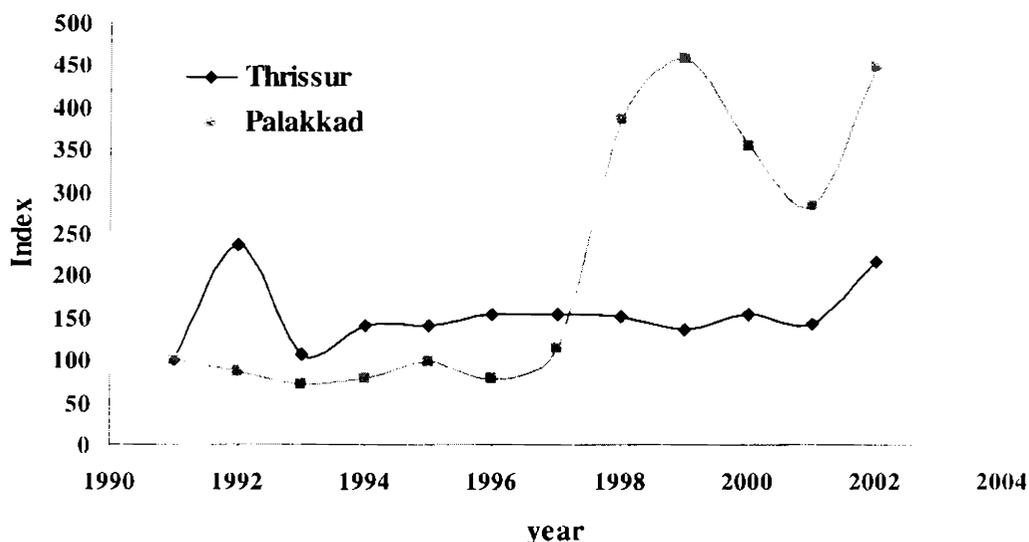
Figure 7.1. Comparison of Indices of Patients Treated in Government Allopathic Institutions in Palakkad and Thrissur

7.1.2. Pattern of Morbidity

Morbidity data related to communicable disease listed in the records of District Medical Office consisted of diseases of 24 categories[3]. Considering the negligible rates in numbering patients in certain diseases, the entire disease groups are classified into 9 categories as discussed below.

Diarrhoea

The group diarrhea disease includes acute watery diarrhea, cholera, persistent diarrhea and dysentery. Over crowding, lack of facilities for excreta disposal and scarcity of drinking water naturally provide an ideal breeding

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[3] Acute diarrhea, Diphtheria, Acute poliomyelitis, tetanus ,neonatal tetanus, Whooping cough, chicken pox, respiratory infection, Measles, pneumonia, Viral hepatitis A&B, Weils, Japanese enciphilitis rabies, meningococal meningitis, syphilis, gonococal infection, pulmonary tuberculosis, guinea worm, anthrax and all other diseases.

217

ground for water born diseases. Naturally, disposal of human excreta, provision of safe drinking water and personal hygiene, particularly washing of hands after defecation, are important in the control of this disease. Prevalence of diarrhea disorders ranked second in the disease profile of both Thrissur and Palakkad.

It was seen from Table 7.2 that, proportion of diarrhea recorded a steady decline both in Thrissur and Palakkad during the period under study. Proportion of diarrhea declined from 62 to 14 showing 52 % fall in this morbidity in Thrissur. Palakkad recorded a higher prevalence rate than Thrissur, till 1997 and since then the rate recorded a steep decline so as to reach 10 in 2002 as against 14 in Thrissur. Thus, Palakkad recorded 58 % fall in the diarrhea cases during the period under study.

Table 7.2.

Morbidity data: Diarrhea

Year	Thrissur		Palakkad	
	Total morbidity	Morbidity rate Per 1000 Hospital admission	Total morbidity	Morbidity rate Per 1000 Hospital admission
1991	81673	62	88900	112
1992	84562	27	87402	129
1993	78008	56	45131	80
1994	83620	45	56851	92
1995	59951	30	44294	57
1996	69279	34	54292	87
1997	55130	27	44825	50
1998	43888	22	56276	18
1999	45044	25	42213	11
2000	47174	23	34186	12
2001	44484	24	29082	13
2002	39032	14	37084	10

Source: District Medical Office, Thrissur and Palakkad
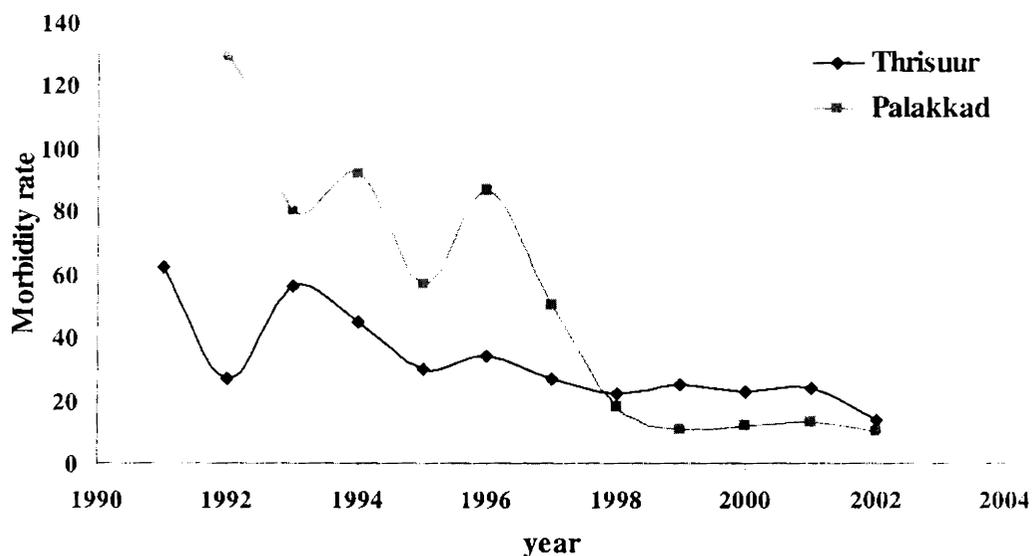
Figure 7.2. Morbidity Rate due to Diarrhea in Palakkad and Thrissur

Linear regression equations were fitted to find out the trend in the morbidity of diarrhea diseased patients. The regression equations fitted were of the following

For Thrissur,

$$Y = 6433.782 - 3.206 \ X \qquad\qquad R^2 = 0.634$$

For Palakkad,

$$Y = 22401.359 - 11.92 \ X \qquad\qquad R^2 = 0.865$$

The negative slope coefficient of the two equations indicates that there is a reduction in the morbidity from 1990 to 2002. Higher slope coefficient indicates that the rate of decrease is higher in Palakkad than Thrissur.

Respiratory Diseases

It is said that infections of the respiratory tract are the most common human ailment. While they are a source of discomfort, disability and loss of time for most adults, they are a substantial cause of morbidity and mortality in young children and the elderly. Many of these infections run natural course in older children and in adults without specific treatment and without complications. However, in young infants, small children and in the elderly, or in persons with impaired respiratory tract reserves, it increases the morbidity and mortality rates. Every year Acute Respiratory Infection (ARI) in young children is responsible for an estimated 4.1 million deaths world wide.[4]

It was estimated that Bangladesh, India, Indonesia, and Nepal together account for 40 % of the global ARI mortality. About 90 % of the ARI are due to pneumonia, which is usually due to prevalence of malnutrition, low birth weight and air pollution in developing countries. In India, ARI is one of the major causes of death in the states and in the districts, with high infant and child mortality rates.

Linear regression equations were fitted to find out the trend in the morbidity of Respiratory diseased patients. Thrissur shows a linear trend and the equation is of the form

$$Y = -31391.6 + 15.839 \, X \qquad\qquad R^2 = 0.622.$$

The positive slope coefficient shows that there is an increase in the respiratory diseased patients in Thrissur. But in Palakkad no trend was observed. This is because a high peak in the index was observed in the year 1998.

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[4] WHO (1982) Tech: Reort Series 671.

Table 7. 3.

Morbidity data: Respiratory disease

Year	Thrissur		Palakkad	
	Morbidity	Morbidity rate per 1000 Hospital admission	Morbidity	Morbidity rate per 1000 Hospital admission
1991	215483	167	161013	204
1992	228316	71	154022	227
1993	245565	175	88087	156
1994	377342	203	116747	189
1995	463386	233	84934	109
1996	463986	227	51248	57
1997	525401	260	410871	87
1998	529164	265	416810	459
1999	552033	310	384151	137
2000	688966	343	432142	106
2001	542149	288	365805	155
2002	666637	234	348843	163

Source: District Medical Office, Thrissur and Palakkad

It emerged clearly from Table 7.3 that respiratory infection contributed the largest share of morbidity in Thrissur as well as in Palakkad district. Though the total number of persons infected by ARI in Thrissur is higher than that of Palakkad during the entire period under study, morbidity rate per 1000 hospital admission for ARI was higher in Palakkad than in Thrissur in the first two years. Proportion of respiratory infection in Thrissur has shown, steady increase from 175 to 234 from 1993 to 2002. As against this, in Palakkad proportion of ARI declined from 1993 to 1996 from 156 to 57. Highest rate was recorded in 1998. But, since then the disease rate increased from 137 to 163 from 1999-2002. Higher prevalence of respiratory infection may be related to humidity, over crowding, and environmental pollution in Thrissur District.
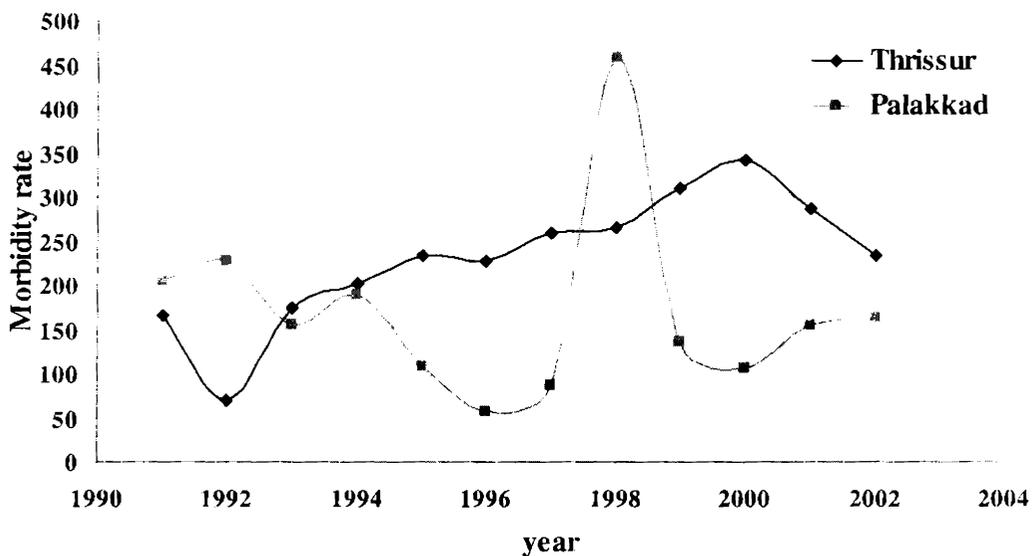
Figure 7.3. Morbidity Rate due to Respiratory Disease in Palakkad and Thrissur

Pulmonary Tuberculosis

Tuberculosis remains a world wide public health problem despite the fact that curative organism was discovered more than 100 years ago and highly effective vaccine are available making tuberculosis a preventable and curable disease. Technologically advanced countries have achieved spectacular results in the control of tuberculosis[5]. The problem of tuberculosis is acute in developing countries, which account for about 95 % of tuberculosis cases, with South East Asian Region, Western Pacific and Africa, the worst affected regions. With 25 % of world's population, SEAR carries disproportionately 38% of world's burden of tuberculosis.

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[5] WHO (2001): World Health Report 2001. Report of the Director General.

India accounts for nearly 1/3rd of global burden of tuberculosis. Every year, approximately 2.2 million persons develop tuberculosis and about 5 lakh people die of tuberculosis[6]. Since 1993, India has successfully implemented Revised National Tuberculosis Control Programme (RNTCP) using DOTS strategy. As of 2001 November, this programme covered about 40 % of the country's population. Present study brings out that tuberculosis stands third among communicable diseases in Thrissur and Palakkad. Proportion of tuberculosis registered a steady decline from 29 to 0.6 from 1991 to 2002 in Thrissur, a decline of 62 % over this period. Proportion of this morbidity in Palakkad was as low as 5 in 1991 and 10 in 1994. Since 1995, morbidity ratio showed a steady decline and in 2002, the rate declined to 0.5, which was lower than in Thrissur (Table 7.4). Thus, both the divisions showed a significant fall in the number of patients treated for tuberculosis cases.

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[6] Government Of India(2002) annual report 2001-02 dGHS NEW Delhi

Table 7.4.

Morbidity Data tuberculosis

Year	Thrissur		Palakkad	
	Total morbidity	Morbidity rate Per 1000 Hospital admission	Total morbidity	Morbidity rate Per 1000 Hospital admission
1991	3221	29	3995	5
1992	2419	0.8	41227	6
1993	1150	7	6512	11
1994	1520	0.82	6272	10
1995	1500	0.8	5292	7
1996	2097	1	4312	7
1997	2331	1	5114	6
1998	2009	10	3247	1
1999	1281	0.7	2189	0.6
2000	1088	0.5	4282	2
2001	1050	0.5	1717	0.7
2002	1197	0.6	1634	0.5

Source: District Medical Office Thrissur and Palakkad
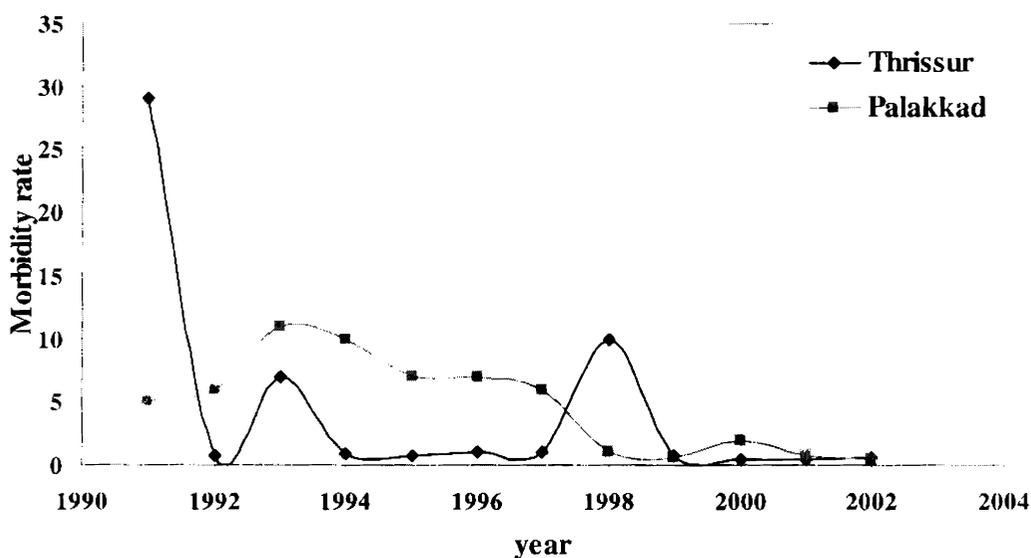
Figure 7.4. Morbidity Rate of Tuberculosis in Palakkad and Thrissur

Figure 7.4 shows that in 1998, Palakkad district has a high increase in morbidity index of tuberculosis.

224

Pneumonia and fever cases

Fever is a quite common disease. Generally, all age groups are exposed to the risk of infection, though the extreme age groups are affected more. The proportion of people who escape infection in any age group would be too small and most of them would be in their 20s. The disability produced by this disease need not be uniform for all types of fever. It is said that, any point in time, 6.75 to 7.9 % of our population suffer from this disease.

Prevalence of pneumonia and fever in Thrissur and Palakkad registered a declining trend during the period under study. Proportion of pneumonia in Thrissur declined from 17 to 1 from 1991 to 1994 and then increased to 19 in 1995 (Figure 7.5). Period 1996 to 1999 showed a steady decline in the morbidity from 4 to 1 and again showed a rising trend since 2000 from 1.3 to 8. Palakkad showed a lower and declining trend in morbidity rate than in Thrissur, during the entire period under study. Proportion of fever in Palakkad showed a steady decline from 2 to 0.2 from 1991 to 2002. Though the rate increased to 9 in 1994, it again registered a marked decline till 2002 (Table 7.5).

Table 7.5.

Morbidity Data: Pneumonia & Fever

Year	Thrissur		Palakkad	
	Total morbidity	Morbidity rate Per 1000 Hospital admission	Total morbidity	Morbidity rate Per 1000 Hospital admission
1991	1365	17	2516	2
1992	1427	2	2576	0.2
1993	889	2	1598	1
1994	709	1	1287	9
1995	1444	19	1242	0.8
1996	2248	4	2535	2
1997	1789	1	987	0.7
1998	3415	1	754	0.4
1999	3240	1	705	0.4
2000	3812	1.3	458	0.2
2001	3770	2	632	0.3
2002	2909	8	590	0.2

Source: District Medical Office Thrissur and Palakkad
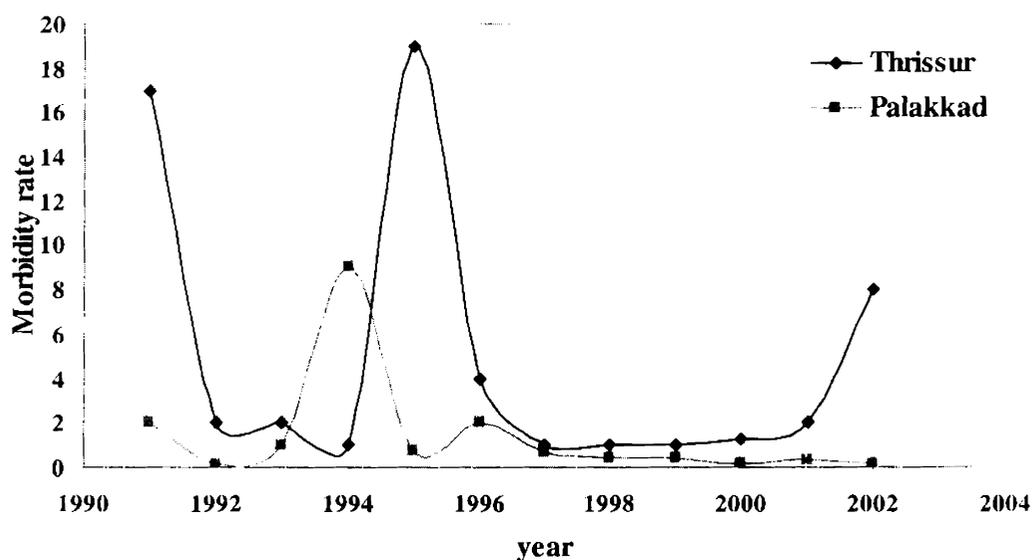
Figure 7. 5. Morbidity Rate of Pneumonia and Fever in Palakkad and Thrissur

226

Viral Hepatitis

Viral hepatitis A and B constitute another category of disease among the communicable disease group. Hepatitis A is an acute infectious disease caused by hepatitis A virus. Being an enterovirus infection, hepatitis A is endemic in most developing countries with frequent outburst of minor or major out breaks. According to WHO, about 10.50 persons per 100,000 are affected annually. Evidence from several developed countries indicates that the incidence of hepatitis A is declining. Hepatitis A virus infection is very common in all the countries of SEAR. Poor standard of hygiene and sanitation facilitate the spread of hepatitis A virus in high endemic areas.

Viral hepatitis A and B together registered a small but steady decline in Thrissur till 1995. Period 1996 showed striking increase in the disease compared to the previous period and then declined to 39 in 2000. But, since 2000, number of patients treated shows a small but steady increase. Proportion of this disease also declined from 0.3 to 0.03 from 1991 to 2002. Incidence of hepatitis A and B, infection is estimated to be 1.0 for first three years in Palakkad, which is slightly higher than the rate recorded by Thrissur division. Proportion of this disease in Palakkad recorded a higher rate of 5 in 1997, followed by continuous fall in the rate till 2002 to reach 0.03, the rate attained by Thrissur division (Table 7.6).

Figure 7.6 shows that in almost all the years, Thrissur showed a low incidence of Viral Hepatitis A& B than Palakkad. A small increase was observed in the year 1996 in Thrissur. But in 1997 Palakkad showed high rate of infection of this disease.

Table 7.6

Morbidity data: Viral Hepatitis A & B

Year	Thrissur		Palakkad	
	Total morbidity	Morbidity rate Per 1000 Hospital admission	Total morbidity	Morbidity rate Per 1000 Hospital admission
1991	424	0.3	799	1
1992	392	0.12	826	1
1993	392	0.3	734	1
1994	343	0.28	564	0.9
1995	311	0.2	272	0.3
1996	1247	0.6	312	0.4
1997	147	0.07	428	5
1998	149	0.07	316	1.0
1999	71	0.03	525	0.1
2000	39	0.02	427	0.2
2001	79	0.04	108	0.4
2002	93	0.03	207	0.03

Source: District Medical Office Thrissur and Palakkad
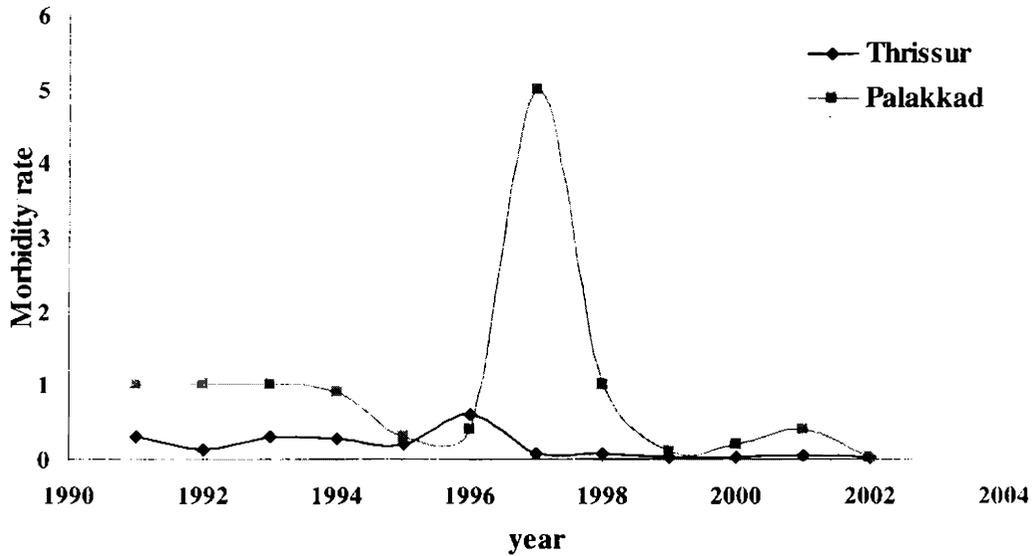
Figure7. 6. Morbidity Rate of Viral Hepatitis A and B in Palakkad and Thrissur

Whooping cough, measles and chicken pox

Whooping cough, measles and chicken–pox together stands 5th in the morbidity group in Thrissur and 6th in Palakkad among the major communicable disease group. There has been steady decline in this morbidity from 1991 to 2002. Prevalence of this disease declined from 1.4 to 0.134 in Thrissur during the period under study (Table 7.7). As against this in Palakkad the prevalence of this morbidity declined from 0.9 to 0.05 from 1991 to 2002. Whooping cough, Measles and chicken pox are considered as a distinct entity for which certain traditional methods are used for treatment. People in rural areas usually do not approach allopathic institutions for treatment of this disease group. This may be one of the reasons for low figure for this disease group.

Sexually Transmitted Diseases

Sexually transmitted diseases included syphilis and gonococal infection. There has been significant fall in the occurrence of morbidity rate of this disease group during the period under study. The incidence of morbidity declined from 0.08 to 0.007 in Thrissur. The lowest rate was recorded in 2001. But in 2002, the rate showed a marginal increase. Palakkad division recorded higher proportion of disease than in Thrissur Division during the entire period under study. Till 1997, morbidity has not registered much decline in Palakkad. But, period 2001 and 2002 marked a small decline in the disease prevalence (Table 7.8).

229

Table 7.7.

Morbidity Data : Whooping Cough, Measles and Chicken –pox

Year	Thrissur		Palakkad	
	Total morbidity	Morbidity rate Per 1000 Hospital admission	Total morbidity	Morbidity rate Per 1000 Hospital admission
1991	1788	1.4	719	0.9
1992	2375	0.7	826	1.2
1993	1076	0.78	451	0.80
1994	987	0.5	561	0.4
1995	540	0.37	331	0.6
1996	1921	0.94	412	0.7
1997	273	0.19	634	0.07
1998	384	0.19	228	0.07
1999	600	0.3	4`0	0.1
2000	533	0.42	313	1.12
2001	465	0.36	297	0.13
2002	361	0.13	207	0.05

Source: District Medical Office Thrissur and Palakkad
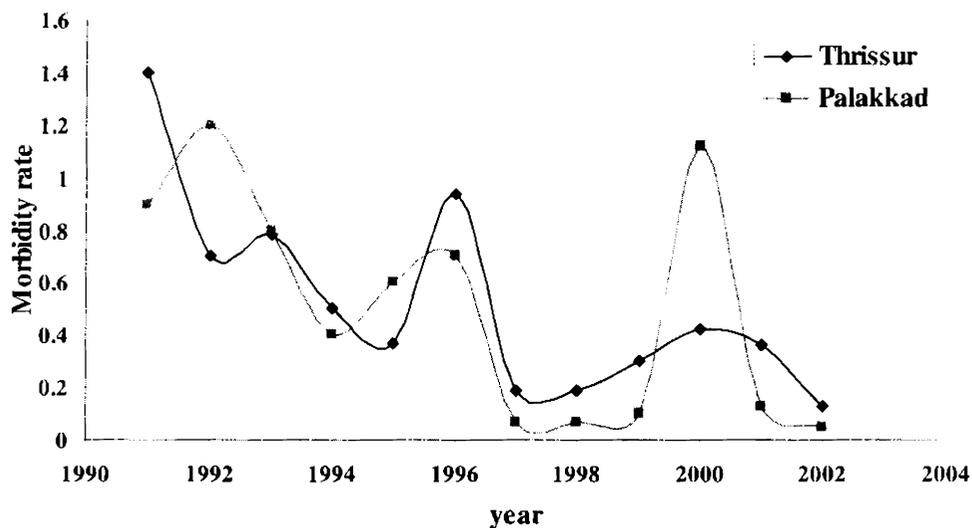
Figure 7.7. Pattern of Morbidity of Whooping Cough, Measles and Chicken -pox in Palakkad and Thrissur

230

Table 7.8.

Morbidity data : Sexually Transmitted Diseases

Year	Thrissur		Palakkad	
	Total morbidity	Morbidity rate Per 1000 Hospital admission	Total morbidity	Morbidity rate Per 1000 Hospital admission
1991	115	0.08	216	0.27
1992	167	0.05	324	0.48
1993	79	0.056	39	0.07
1994	79	0.04	212	0.34
1995	11	0.01	57	0.07
1996	304	0.149	125	0.20
1997	246	0.12	215	0.24
1998	-	-	-	-
1999	-	-	-	-
2000		-	-	-
2001	1	0.001	165	0.07
2002	15	0.001	124	0.04

Source: District Medical Office Thrissur and Palakkad

Weils

No weils case was registered in Thrissur till 1999 and since then it has increased from 45 cases to 339 showing an increase of 653 %. Weils Cases are seen from 2001 in Palakkad and the number of cases declined from 13 to 11 in 2002.

All other diseases

All other diseases include chronic disease like cardiovascular disease. cancer, hypertension, diabetes etc., in addition to the minor acute diseases. Table 7.9 shows that more than 70 % of the reported morbidity related to other diseases that include chronic non-communicable diseases in Thrissur. Period 1992 show an increase of 17 % from the previous period. Since then there has

been steady decline in the morbidity till 2000. Morbidity again showed an increasing trend in Thrissur from 632 to 686 in 2001 and then to 750 in 2002. Though Palakkad started with a lower proportion recorded a steady rise in morbidity from 674 in 1991 to 890 in 2002.

Table 7.9.

Morbidity data: All other Diseases

Year	Thrissur		Palakkad	
	Total morbidity	Morbidity rate Per 1000 Hospital admission	Total morbidity	Morbidity rate Per 1000 Hospital admission
1991	1006937	767	531463	674
1992	2789468	897	428312	632
1993	1073862	766	420578	747
1994	1385531	748	437175	706
1995	1455772	734	642316	824
1996	1493816	734	512428	819
1997	1434591	710	431216	481
1998	1414064	710	2564210	842
1999	1179012	662	3184216	880
2000	127007	632	2318141	830
2001	1288137	686	1840311	821
2002	2135434	750	3150171	890

Source: District Medical Office Thrissur and Palakkad
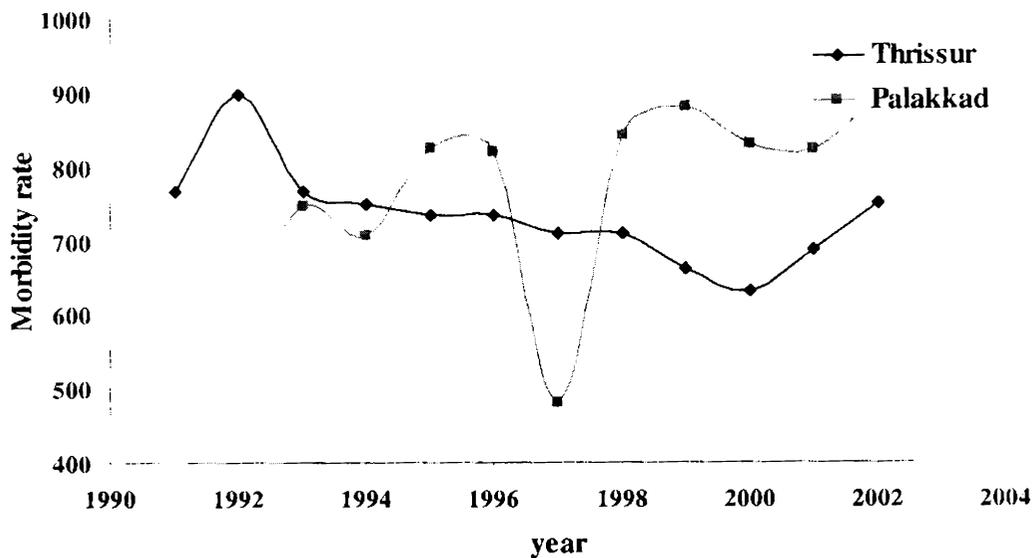
Figure 7.8. Pattern of morbidity of all other diseases in Palakkad and Thrissur

7.2. Analysis of Curative Health Care of Primary Health Centers

Curative health care services rendered by the primary health centers can be judged by out patients or in-patients services provided by them as the basic purpose of the primary health center is "Better Patient Care and return the patient back to the community as a productive unit". The information gathered from primary health centers in Chittur Block and Kodungallur Block for the period 1995-2004 is analysed to get a detailed picture of disease pattern of rural areas. The out-Patient Department is one of the most important Divisions of the primary health care. All the patients suffering from diseases of minor, serious. acute, and chronic nature have been examined and treated. It has provided such health care services as provision of diagnostic, curative, preventive and rehabilitative services on an ambulatory basis to the rural population of the area. After the patients have been examined in the outpatient, treatment is being provided to them. Inpatients and out patients treated for various diseases for a

233

period of nine years from 1995 in primary health centers in Kodungallur Block and Chittur Block is taken in to account to analyse the curative services provided by the primary health center. The trend in the utility of primary health center in terms of in-patient and out-patient treatment in Kodungallur and Chittur are given in the following Table 7.10 and 7.11.

Table 7.10.

Trend in Inpatient and Outpatient Treated in Chittur Block PHC

Year	Out patient	Index	In patient	Index	Total	Index
1995	36242	100	1410	100	37652	100
1996	42328	116	725	51	43043	114
1997	41145	113	528	37	41673	111
1998	22368	62	476	34	22844	61
1999	28419	78	425	40	38791	77
2000	35425	98	366	26	32782	103
2001	32434	89	348	25	32418	87
2002	28436	78	210	15	28646	76
2003	31476	86	182	13	31658	84

Source: Primary health center, Chittur
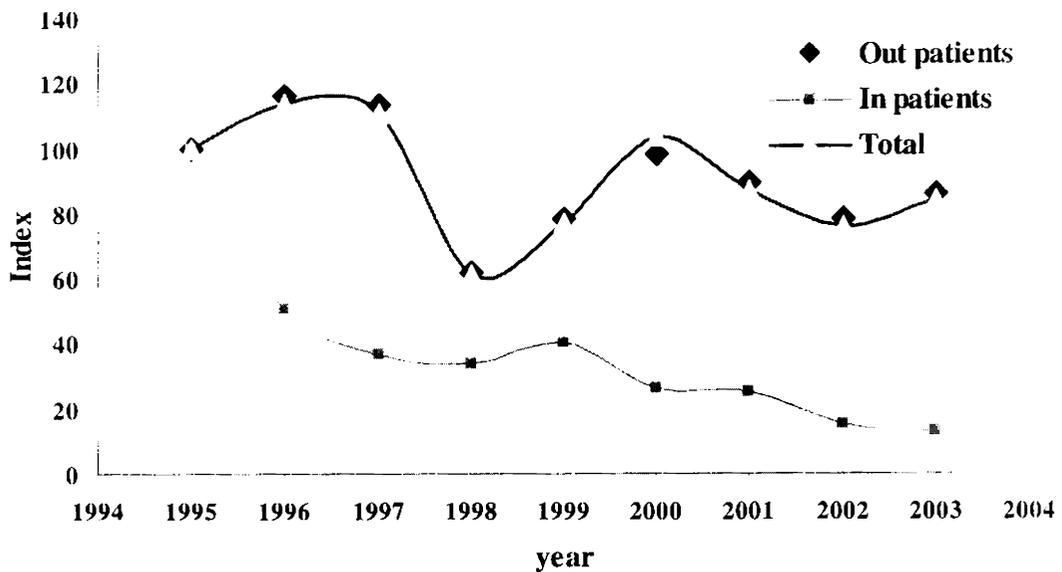
Figure 7.9. Trend in Inpatient and Outpatient Treated in Chittur Block PHC

Figure shows that trend in inpatients number is decreasing gradually from 1994 to 2003. But the total number and the inpatients number shows no such trend. Regression equation was fitted to in-patients number from year to year. It forms a linear trend of the following form.

$$Y = 16296.422 - 8.133X. \qquad\qquad R^2 = 0.722$$

Negative slope indicate the decreasing trend in the out patients number.

Information collected from the records of the PHC from Chittur reveals that there has been a steady decline in the number of inpatients and out patients treated in this Block, from 1995 to 1998, indicating more than 25 % and 70 % fall in the former and latter respectively. Period 1999, recorded a marginal increase in both inpatient and out patient care. Since 1999, there has been steady

235

decline in the number of inpatients treated recording 87 % decline during the period under study where as out patient data showed 14 % decline.

Trend in in-patients and out patients treated in Kodungallur Block PHC

With regard to the patients treated in the Kodungallur block, it was seen that Kodungallur also recorded 14 % fall in the number of out-patients treated during the period under study. Period 1998 showed the lowest rate of utilization of health centers in both divisions. Rate of utilization of inpatient care showed a better position in Kodungallur than its counter part, though recorded 25 % fall during the period under study. In terms of total patients treated, both the divisions recorded more than 10 % decline. There has been significant decline in the utilization of inpatient care in both the divisions compared to out patient care.

Table 7.11.

Patients Treated in Kodungallur Block PHC

Year	Out patient	Index	In patient	Index	Total	Index
1995	38884	100	1523	100	40407	100
1996	41104	205	2204	144	43308	107
1997	28606	74	1801	118	30407	75
1998	20825	54	1104	75	21939	54
1999	38619	99	2022	132	40641	100.5
2000	37272	96	1956	128	39228	97
2001	36331	93	1404	92	37735	93
2002	34536	88	1208	79	35744	88
2003	33486	86	146	75	34632	88

Source: Primary health center, Kodungallur
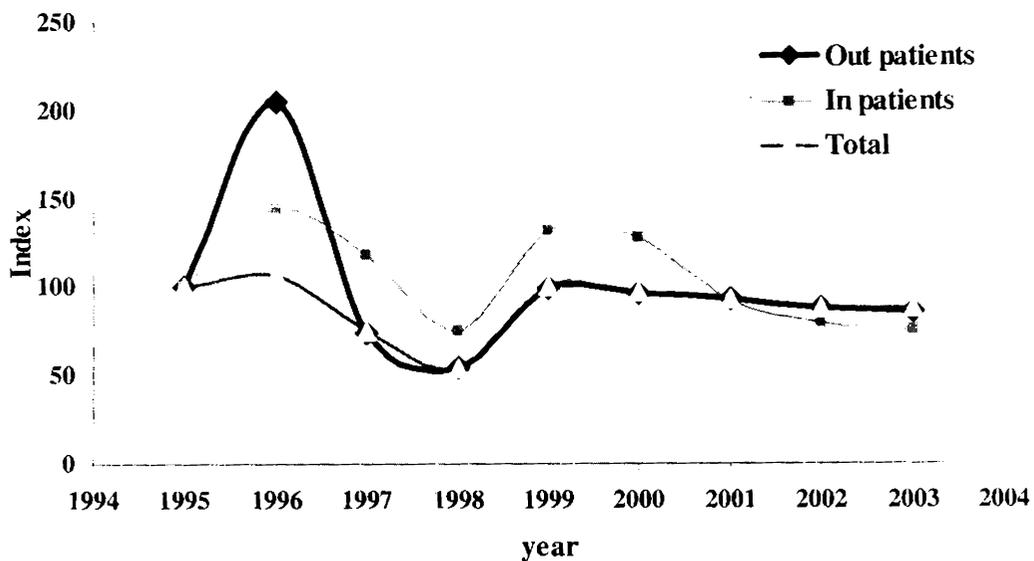
Figure 7.10. Trend in Inpatient and Outpatient Treated in Kodungallur Block PHC

Regression equation was fitted to in patients number from year to year. But no significant trend was observed in the in patients number.

Pattern of Morbidity

Patients treated for various diseases are analysed next to give the morbidity profile of rural areas in these two areas. With regard to the type of diseases for which treatment is given in Kodungallur block PHC for a period of nine years, it is seen that Diarrhea, fever, respiratory diseases and tuberculosis are the major type of diseases seen in this area. It emerges clearly that respiratory disease and diarrhea infection contribute the largest share of morbidity among the patients who visited the primary health centers. Kodungallur, being a coastal area with humid tropical atmosphere, provide conditions conducive to the spread of these diseases. Table 7.12 shows that, proportion of diarrhea, which was 2.56 % of the total disease in 1995, rose to 15

237

% in 1998 and declined to 9.81 % in 2000. Period 2001 and 2002 recorded more than 10 % of the total morbidity. Respiratory disease showed an increase from 4.2 % in 1995 to 19 % in 2003. Typhoid registers a steady decline till 2000.

Tuberculosis increased from 0.05 % to 11 .5 % during the study period. Fever and pneumonia has also increased from 0.006 % to more than 7 % over this period. Separate data for in-patient and out-patient treated for various diseases in Chittur Block PHC is not available. Total patients treated (OP and IP) for various diseases are given as is shown below in Table 7.12.

Table 7.12.

Patients Treated for Various Diseases in Kodungallur Block: PHC

Year	Diarrhoea	Resp;	Typhoid	Malaria	TB	Fever Pneumonia	Other	Total
1995	39(2.56)	64 (4.2)	18 (1.2)	29	-	4 (0.006)	1369	152.3
1996	222(10)	86 (3.9)	5 (0.2)	-	36 (1.6)	-	1855	2204
1997	183(10.1)	141(7.82)	4 (0.2)	-	12(0.66)	11(0.6)	1450	1801
1998	167(15.3)	98(8.9)	4(0.2)	-	360(32.6)	25(2.26)	417	1104
1999	195(9.6)	143(7.0)	4(0.1)	2	45(2.22)	24(1.19)	1609	2022
2000	192(9.81)	183(9.3)	3(0.1)	4	86(4.39)	13(0.66)	1475	1956
2001	156(11.1)	120(8.5)	5(0.35)	1	115(8.19)	32(2.28)	975	1404
2002	142 (11.75)	184(15.23)	8(0.6)	2	112(9.27)	48(3.98)	712	1208
2003	138 (12)	216 (19)	7(0.6)	1	132(11.51)	86(7.50)	566	1146

Source;Kodungallur PHC based on IP diagnosis

238

Table7.13.

Morbidity data: Chittur Block PHC

Diseases	97	98	99	2000	2001
Gastroenteritis	348	360	358	349	479
TB	5	7	4	8	-
Leprosy	6	8	4	4	4
Anchyliostomiasis	1475	1322	1288	1015	1484
Diabitis	8	14	5	18	37
Amebiac Dysentry	4236	3682	3278	2353	4065
Epililepsy	8	7	4	3	6
Heart Diseases	28	33	30	44	33
Bronchitis	625	412	550	637	1014
Teeth ACHE	348	625	726	389	414
Ulcer stomach	30	48	21	18	32
Urinary tract inf:	18	40	20	16	33
Skin Disease	786	635	641	598	4
Malaria	4	2	2	4	-
Fever	412	618	0	13	7
Pneumonia	4-	-	0	18	0
Intestinal Infect:	424	318	0	0536	
Typhoid Fever	2	1	-	-	1
Antorio Scherosis	18	13	-	-	25
Hydrocil	4	2	-	-	9
MenstrualDisorders	5	2	-	-	28
Arthritis	7	9		-	31
Malnutrition	312	428	481	565	986

Source: PHC Chittur

Table 7.13, shows morbidity profile of Chittur division based on the patients treated in the primary health center. Proportion of patients suffering from nutritional deficiency disease is quite large throughout the period under review. Chronic diseases like gastroenteritis, leprosy, dysentery, skin disease contribute to major share of the diseases. At the same time, acute diseases like heart disease and diabetics are also recorded a marginal increase. Evidence of

malaria, typhoid fever, intestinal infection indicates the need to strengthen the health care activity of the primary health centers in these areas.

7.3. Patients Treated in Private Health Care Institution in Chittur and Kodungallur Divisions

Data related to disease profile collected from primary health centers are supposed to give only partial view, for; there is an increasing trend among the people to approach private institutions. So to get a complete picture regarding curative measures, data is collected from private hospital in Kodungallur and Chittur Block so as to assess the morbidity trend of higher income group. Next. our study proceed to analyse the data collected from private institutions in Chittur and Kodungallur Block so as to know the trend in the patients treated in these institutions. This will enable us to realize the real trend in the number of patients seeking treatment. Data given from these institutions are not completely reliable since there are no official records of the private institutions and they are reluctant to show the real picture. However, the available data is collected and analysed to have compatibility, keeping in view the limitations in the data.

Data related to the patients treated in the private institutions in both the divisions revealed that total number of patients treated in these divisions have recorded more than 50 % increase. Rate of utilization of in patient care is shown to be an increase of more than 80 % in Chittur and nearly 75 % in Kodungallur division. This indicate that low and declining rate of utilization of health centers in both the divisions are not due to the declining rate of morbidity in these areas but due to the preference of the people towards the private institutions specifically, towards the utilization of inpatient care.

Table 7.14.

Patients treated in the outpatient and in patient department – Chittur (Private)

Years	Out patients	Index	In patients	Index	Total	Index
1995	25675	100	2618	100	28293	100
1996	26428	102.9	3714	141.86	30142	106.5
1997	32432	126.3	4312	164.7	36744	129.86
1998	36412	141.8	5219	199.35	37631	133.0
33.0	38110	148.4	5114	195.34	43224	152.77
2000	52.77	144.9	5326	203.3	42538	150.3
2001	35436	138.0	4718	180.2	40154	141.9
2002	42118	164.04	5314	266.6	47432	167.64
2003	41145	160.25	4824	184.26	45969	162.47

Source: Hospital records, Chittur

Table 7.15.

Patients Treated in the Outpatient and Inpatient Department in Kodungallur

(Private)

Years	Out Patients	Index	Inpatients	Index	Total	Index
1995	45222	100	7200	100	52422	100
1996	35443	78	7240	100.5	42683	81
1997	52428	115	8410	117	60838	116
1998	58625	129	8560	119	67185	128
1999	72434	160	9248	128	81682	156
2000	73228	162	9786	135	83014	158
2001	75625	167	10245	142	85870	164
2002	77114	171	11108	154.3	88222	168
2003	77238	171	12432	173.0	89670	171

Source: Hospital records, Kodungallur

Table 7.16.

Patients Treated for Various Diseases in Kodungallur (Private),

Years	Diarrhoea	Respiratory disease	TB	Fever (Pane:)	Malaria	Heart Attack	Typhoid	Hepatitis	Stroke	Total
1995	80(1.11)	355(4.9)	15(0.2)	125(1.73)	2	140(1.9)	120(1.6)	14(0.2)	18(0.3)	7200
1996	210(2.9)	795(10.9)	18(0.3)	148(2.0)	-	138(1.9)	69(0.9)	290.02)	8(0.1)	7240
1997	245(2.9)	835(9.9)	20(0.2)	186(2.21)	-	210(2.5)	45(0.5)	14(0.2)	36(0.4)	8410
1998	207(2.4)	810(9.4)	35(0.4)	249(2.9)	1	235(2.7)	73(8.5)	78(0.9)	49(0.6)	8560
1999	18491.98)	1028(11.1)	32(0.4)	318(3.4)	3	289(3.1)	86(0.9)	96(1.09)	72(0.8)	9248
2000	235(2.40)	1245(12.7)	41(0.4)	419(4.3)	2	312(3.2)	75(0.8)	148(1.5)	109(1.1)	9786
2001	280(2.7)	1310(12.8)	48(0.5)	542(5.3)	4	428(4.2)	88(0.9)	186(1.8)	139(1.4)	10245
2002	365(3.3)	1879(16.9)	37(0.3)	427(3.9)		51394.6)	49(0.4)	179(1.6)	215(1.4)	11108
2003	378(3.0)	1896(15.3)	42(0.3)	437(3.5)	-	724(5.8)	450.(4)	246(1.9)	312(2.5)	12432

Source: IP diagnosis: Hospital Records, Kodungallur

Disease profile of Kodungallur based on the admission to a nearby private hospital is summarized in the Table 7.16. Analysis of this data over this period is expected to bring out changes in the disease pattern, if any, resulting from changes in the age composition and life style of the population. Table7.16 summarizes trend in the selected diseases admitted to the hospital over time. It is again, striking to see that diarrhea disorders and dysentery together do not exhibit a consistent declining trend over the period under study. The proportion of patients treated for diarrhea, which was 1.1 % of the total during the period 1995, rose to 3.0 by 2003. Respiratory disease contributed major share of the disease as in the case of health centers. Proportion of respiratory disease increased from 4.9 to 15.25 during the period under study. Enteric fever also registers a steady increase from 1.73 to 3.5. Chronic diseases like heart disease. hepatic B, stroke, etc. showed an increasing trend over this period. It has been seen that malaria, tuberculosis and typhoid are making a deadly come back here. At the same time, diseases such as diarrhea, and respiratory disease has not declined.

7.4. Morbidity profile of the sample population

Next our study proceeds to analyse the data collected from the sample population related to the prevalence of illness. Primary data was collected from the sample population using a pre-designed schedule to have self perceived morbidity measure. Information collected from the hospital records will not include those items for which treatment is not sought by the people. So to get a complete picture, respondents were asked to report whether he or she had suffered from any illness during the month prior to the date of interview. If any person had suffered from more than one illness during the reference periods, whether simultaneously or at different points of time with in the one month

243

reference period, these will be entered as a separate illness episode. The survey was based on lay reporting of illness and not on clinical examination. The distribution of reported illness by the sample households is presented in the Table 7.17. It is striking to note that Morbidity Prevalence Rate (acute and chronic) worked out to be 309.6 and 352.4 per thousand in Kodungallur and Chittur respectively. This seems to be significantly higher when compared to the previous studies[7] (ref: cha.5).

Among the various types of illness, fever which includes viral fever, flu and other non specific fevers seems to be the most common illness in both divisions. Illness Prevalence Rate (IPR) of fever in Kodungallur and Chittur is 94 and 87 per thousand respectively. IPR rate of fever worked out to be 32.5 and 28 per 1000 as per NCAER 1995 and 1994 estimates. IPR of fever is lower when compared to 118 of KSSP (1987) study. Prevalent rate of fever had declined to 67.5 as per the study conducted by Kunnikannan and Aravindan (2000). Next in importance was the respiratory infection which includes common cold, cough, nose and throat discomfort and bronchitis in both the divisions though Chittur division has a lower rate, than the rate of Kodungallur (34 as against 41). IPR of respiratory disease was 12.8 NCAER (1995), 16.5 KSSP (1987) and 14.3 Kunnikannan and Aravindan (2000) which is significantly lower. Tuberculosis, the world's biggest Killer also has not shown any decline in IPR rate in these divisions. It was estimated that the prevalence rate of TB (per thousand) is twice that of Palakkad in Kodungallur (8.62 as against 4.98). NCAER (1995) shows it as 2.4 and 5.04 in Human Development Report (2000). Prevalence rate of Diarrhoea in Palakkad recorded more than double that of Kodungallur (40 against 17).This is also higher than the previous

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[7] MPR of 103.1of NCAER(1995), 122.9of NCAER(1994), 206.39 of KSSP (1987) and Kunnikannan and Aravindan (2000).

244

reports of 7.6 (NCAER1995) and 6 (Human Development Report of 2000). Prevalence rate of heart disease showed a lower rate in Kodungallur than Chittur. (4.43 against 9.97). Human development report (2000) worked out the prevalence of heart disease of Kerala as 9.1where as it was 1.5 as per the study conducted by Kunnikannan and Aravindan (2000).

Table 7.17.

Morbidity Profile

Kodungallur		Chittur	
Disease	No: of persons (Per 1000)	Disease	No: of persons (Per 1000)
Fever	94	Fever	87
TB	8.62	TB	4.98
Respiratory	40.9	Respiratory	34.87
Polio	4.3	Polio	2.49
Chicken pox	3	Chicken Pox	8
Blood Pressure	8.62	Blood Pressure	12.45
Heart Attack	4.43	Heart Attack	9.97
Diarrhea	17	Diarrhea	39.85
Eye Disease	9	Eye Disease	24.91
Malaria	4	Malaria	1.25
Stroke	6.47	Stroke	4.98
Head ache, body ache and back ache.	40.99	Head ache, body ache and back ache	14
Mums	9	Cholera	2
Measles	3	Others	94.65
Fits	4.43		
Hepatic B	4.43		
Others	65		
Total	309.6	Total	352.4

Source: Survey data

It was seen from the table that in both the divisions there is higher rate of chronic degenerative diseases like hyper tension, heart disease, stroke. At the

245

same time re emergence of communicable infectious diseases like malaria. cholera typhoid etc.

7.4.1. House hold expenditure on health care

Based on the expenditure incurred by the house holds during the one month reference period for the treatment of illness, the per capita annual household expenditure on curative health care has been estimated. Per capita annual expenditure on curative health care recorded higher than the previous studies[8]. It is seen that health expenditure increases as we move to the higher classes in both divisions.

Table 7.18.

Average Health Expenditure

SES Class	Palakkad	Kodungallur
SES 1	253	220
SES 2	354	360
SES 3	382	375

Source: Survey data

7.4.2. Utilisation of Health Care Services.

The utilization of health care services depends on the availability of quality of health care services at a reasonable distance and on the ability of the people to utilise the health services effectively. Thus, the provision of appropriate health infrastructure is a necessary but not a sufficient condition for health care utilization. In this survey, an attempt was made to study the pattern

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[8] As per NCAER study 1995 health expenditure was Rs.184 and 285for rural and urban Study conducted by Kunnikannan and Aravindan (2000) it was Rs.165.

of utilization of health care services for various types of disease by socio economic characteristics of the households.

Table 7.19.

Utilisation of Health Care Institution

SES Class	Chittur (%)		Kodungallur (%)	
	Govt.	Private	Govt.	Private
SES 1	38	62	42	58
SES 2	29	71	34	66
SES 3	27	73	30	70

Source: Survey data

It was seen that with an improvement in the income status of the households, the utilization of public health facilities declined and the utilization of private facilities increased. It was surprising to see that more than 50% of the households, even from among the lower income utilize private for curative care. This showed the preference of the people towards private institutions, in spite of the free services of government institutions. So the next question was whether they were against in charging user fees for government institutions. All the respondents in both the divisions were not against charging a nominal amount of user fees, provided they are getting better services from these institutions. Moreover, no one in these divisions is covered under health insurance. If it is introduced in the rural areas, with out any doubt, it will lessen their disease burden.

Summary

To evaluate the performance of curative measures, Present study compiled data on disease of patients treated in the government allopathic medical institutions in Thrissur and Palakkad Districts and in two primary health centers with limited facilities for inpatients each one belonging to Palakkad and Thrissur and two private institutions one from Thrissur and other from Palakkad. These are institutions for which the rural population approach for prompt and immediate relief and the information collected from these centers can be expected to yield a general picture of the common illness experienced by the rural population. In addition to the above, information collected from the primary data is also examined to assess the nature of morbidity. It was surprising to see that inspite of the significant achievements in structural developments in health sector, morbidity profile of the study area gives us a dismal picture. Data collected from primary sources revealed higher IPR of chronic degenerative diseases like heart disease, hyper tension, etc. At the same time evidence of deadly come back of communicable diseases like malaria, cholera and typhoid. Though the morbidity data of the two districts related to government allopathic medical institutions, registered a significant fall in the communicable diseases like diarrhea, T.B. fever etc. Respiratory diseases seem to be the largest contributor in the morbidity picture as per the study.

As against this, the rate of utilization of primary health centers and government allopathic medical institutions seems to be declining, in terms of both divisions in terms of inpatient and out patient care. The rate of fall in in-patient care is significantly higher than the out-patient care. This is in contrast to the higher and increasing rate of utilization of private health care institution.

especially significant increasing in the in-patient department. This shows increasing preference of the people towards private because of the poor performance of the public institutions.

Per capita annual expenditure on curative health care recorded higher than the previous studies. It was seen that health expenditure increases as we move to the higher classes in both the divisions. In spite of the free services of Government institutions there was increasing preference towards private health care institutions even among the lower income group. People were not against charging user fees if they are getting quality services from Government institutions.

CHAPTER 8

PERFORMANCE EVALUATION OF PRIMARY HEALTH CENTERS FROM THE BENEFICIARY POINT OF VIEW

Primary health centers are the nuclei, through which the primary health care services are provided to the people by the Government. A field survey of a sample of the households of Thrissur and Palakkad District was conducted to elicit the opinion of the people related to their awareness, accessibility, availability and the efficiency with which these institutions serve people. The results of this survey are presented in this section, for the evaluation of the services of primary health centers.

Kodungallur Block and Chittur Block were selected from Thrissur and Palakkad District respectively for conducting the survey. Three Panchayats were selected from each of these blocks and 50 households were selected at random from each Panchayat. Thus, altogether a sample of 300 households was selected for this study. Since Maternal and Child Health care is a major element of primary health care, a sample unit here is defined as those households, where there was delivery within one year prior to the survey and belonged to low and middle income groups of rural areas. The entire households were divided into three groups SES1, SES 2, and SES 3 on the basis of socio economic variables. Basic demographic indicators of sample area are shown in Table 8.1

Table 8.1.

Basic Demographic Indicators

Name of the Block	Kodungallur	Chittur
Area (km)	36.01	261.24
Density of population per Sq. km	2622	574
No of house holds where there was delivery within one year prior to the survey	876	973
Sex ratio	1081	1023
Male literacy (%)	94.30	77.9
Female literacy (%)	86.24	59.31
Total literacy (%)	90.07	68.50

Source: Panchayat statistics Trichur and Palakkad 1998; Women in Kerala (2001) Economics and statistics Trivandrum. Block panchyaths Kodungallur and Chittur

8.1. General information

Total number of people in the surveyed households was, 973 in Kodungallur and 803 in Chittur block. The gender wise distribution shows that, there are 473 males and 500 females in Kodungallur (sex ratio being 1057 females per 1000 males) and 390 and 413 males and females respectively in Chittur Block (1059 females per 1000 males). Thus, in the two areas of samples, sex ratio is favorable to women. Estimated sex ratio is lower than the census report of 2001 in Kodungallur and higher than the census report in Chittur[1] (Table 8.2).

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[1] As per census report of 2001, sex ratio of Kodungallur is estimated to be 1081 and 1051 for Chittur.

Table 8.2.

Classification According to Sex

Sex	Kodungallur		Chittur	
	No	%	No	%
Male	473	48.61	390	48.57
Female	500	51.39	413	51.43
Total	973	100	803	100

Source: Survey data

With reference to the age composition, these two areas resemble the same characteristics. Forty five percentage of the total population in both the divisions is in the age group 25-60. In Kodungallur division, 21 % constituted children below 5, whereas its counter part in Chittur division was only 12%. Proportion of children, between 5-15 in both areas worked out to be 11 %. As far as the aged population is concerned, 13 % of population in Kodungallur and 12 % in Palakkad came under this group (Table 8.3).

Table 8.3.

Age Composition

Age Composition	Kodungallur		Chittur		Total
<5	207	(21)	172	(12)	372
5-15	102	(11)	92	(11)	194
15-25	98	(10)	78	(8)	176
25-60	441	(10)	363	(45)	804
60+	125	(45)	98	(12)	223
Total	973	(100)	803	(100)	1776

Source: Survey data (Figures in the parenthesis are percentages)

8.2. Operational Efficiency of Primary Health Care System

Operational efficiency of primary health care system is measured through operational efficiency of health centers from the beneficiary point of view using awareness, accessibility, availability and the efficiency with which these institutions serve the people. In addition, evaluation of maternal and child health care services also analysed in this section.

8.2.1. Operational Efficiency of Primary Health Centers

Operational efficiency of Primary Health Centers are measured through quality assessment using the information collected from the people related to their awareness, accessibility, availability and the efficiency with which these institutions serve people. These are discussed in this section for the performance evaluation of primary health centers.

Degree of awareness

Primary health centers are the key to access to the Governmental health care system in the state. Respondents were asked to express the degree of their awareness of the availability of the primary health care services in the primary health centers. The replies are presented in Table 8.4. Degree of awareness is significantly higher in Chittur Block than in Kodungallur Block. Thus, 97 % of the respondents are aware of the functioning of primary health centers in Chittur division, where as in Kodungallur division, only 77 % are aware of it. Z test was applied to test whether there is any significant difference in the proportion of sample units who are aware of the primary health centers between the study areas. The calculated value of Z (5.4602) is greater than table value (1.96) at 5 % level of

significance. This indicates that there is significant difference in the proportion of sample units, who are aware of primary health centers.

Table 8.4.

Degree of Awareness of PHC

Awareness	Kodungallur	Chittur
Aware	116 (77)	146 (97)
Not aware	34 (23)	4 (3)

Source: Survey data   Z=5.4602

Degree of awareness and SES classification

With regard to SES classification, it was seen that in both divisions rate of awareness was higher among lower strata and lower among higher groups (Table 8.5). In Chittur division, all are aware of the functioning of the primary health centers while in Kodungallur, 17 % were unaware of their functioning among SES 1 groups. Such lack of knowledge about the existence of a nearby primary health center in Kodungallur could be related to the distance especially in Methala, since the health center was located in Azhicode. This was a curious finding, given to the high level of awareness regarding health care among the rural population. Additional information regarding utilization of services of these institutions by the people will give more definite answers.

Table 8.5.

Degree of Awareness and SES Classification

States	Aware			Not aware		
	K	C	Tot	K	C	T
SES1	28	52	80	6	0	6
	(83)	(100)	(31)	(17)		
SES2	60	76	132	11	0	15
	(85)	(95)		(15)		
SES3	28	18	50	17	4	17
	(62)	(100)		(38)		
Total	116	146	262	34	4	38

Source: Survey data, Chi square = 8.4352

A chi square test was employed in the case of Kodungalloor to test whether there is any association between SES classes and degree of awareness. The computed value of Chi square (8.4352) is significant at 5 % level indicating that there is an association between degree of awareness and SES classes. In SES 1 and SES 2 classes, more than 80% have the awareness of PHC. But in SES3 class, only 62 % are aware of the above programme. Degree of awareness depends on SES classes. Degree of awareness related to the existence of PHC is higher among lower income and vice versa. But in the case of Chittur Block, almost all are aware about the PHC programme.

Services of PHC availed

Rate of utilization of health care institutions by the people in that area is an important indicator of the performance of that institution. Opinions have been collected from the respondents regarding the utilization of the services from this institution within one year prior to the survey. It was seen that in Kodungallur, 65 % of the people have availed the services of health center as against the 52 %

of utilization in Chittur division. It is surprising to see that in spite of the higher degree of awareness among the people in Chittur, rate of utilization is lower than their counter part in Kodungallur. Most of the medical officers who worked in both areas opined that people in Trichur district would fully avail any serves provided to them even though people in Palakkad lag behind even by persuasion. Higher rate of literacy may be an important factor in influencing the rate of utilization in Kodungalloor division. However, 35 % of even among the people in Kodungallur have not availed any services from health centers (Table 8.6).

Table 8.6.

Services of PHC Availed

Opinion	Kodungallur	Chittur
Availed	98 (65)	78 (52)
Not availed	52 (35)	72 (48)
Total	150	150

Source: Survey data, Z test = 2.3667

Z test applied confirms that more people in the Kodungallor block availed the services of primary health center than Chittor block. The calculated value of Z (2.3667) is greater than table value (1.56) at 5 % level of significance. So the hypothesis that, attitude in two districts about the availing of services of primary health centre is equal is rejected, indicating that the services of PHC availed is different for the two blocks. i.e. services of primary health center availed is higher among Kodungalloor than Chittoor.
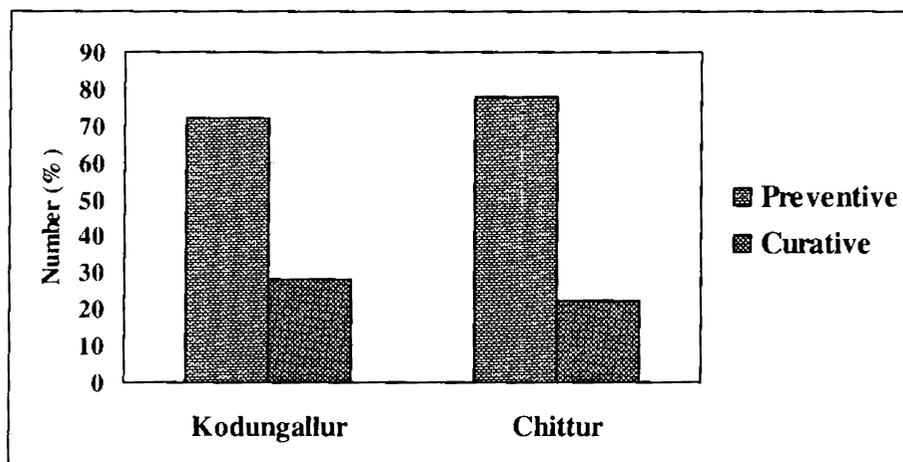
Figure 8.1. Types of Services Availed by the Two Divisions

Types of services availed

Opinion collected from the respondents regarding the type of services availed by them revealed that the services mainly availed by the people from this institutions are preventive in nature like vitamin tablets for pregnant women and iron and folic acid for pregnant women, vaccines for infants and children etc. If we exclude these services, rate of utilization will be below 30 % in both divisions. In Kodungallur 28 % of the respondents have availed the curative service where as in Chittur only 22 % have availed the curative service (Table 8.7). This point to the fact that, people do not prefer these institutions for curative care. Moreover, the functions of these institutions even today are confined to the areas of family planning and immunization. In the 9th plan and in the 2001 National Health Policy, Government of India has stressed the need to strengthen the curative services of primary health centers and is recommended to appoint a specialist in these institutions. In spite of these efforts the rate of utilization of curative services has not improved much in these areas.

257

Table 8.7.

Types of Services Availed

Name of Block	Preventive	Curative
KODUNGALLUR	108 (72)	42 (28)
CHITTUR	117 (78)	33 (22)

Source: Survey data, Z =0.6934
Value in the parenthesis is percentages

Z test was applied to know whether there is any difference in the proportion between the districts in case of the type of services availed by the people from primary health centers. The Z value calculated is 0.6934 which is less than table value (1.96). This shows that there is no significant difference in the type of services availed by the people in the two Districts.

8.2.2. Rate of Utilization by SES Classes

Rate of utilization of health center among the different SES classes is also worked out and the results are presented in Table 8.8. With regard to the rate of utilization among different groups, it was seen that rate of utilization decreases as we move to the higher classes in Chittur division. Thus, it is 69 % for SES1, 45 % for SES 2 and 36 % for SES 3. But in Kodungallur it is 62 % for both lower and higher groups and 68 % for middle-income groups. It is satisfying to note that rate of utilization is above 60 % in all classes in Kodungallur division. This is significantly higher than the state averages of 40 % (Aravindan, 2000). But for Chittur, it is lower among 2nd and 3rd classes, more specifically, lower than the State average in SES 3 classes. In this context, next session is intended to discuss the reason for not availing these services, which give services free of cost and is working mainly for rural poor.

258

Table 8.8.

Rate of Utilization of PHC by SES

Status	Availed		Not availed	
	KODUNGALLUR	CHITTUR	KODUNGALLUR	CHITTUR
SES 1	22 (62)	36 (69)	12 (38)	16 (31)
SES 2	48 (68)	34 (45)	23 (32)	42 (55)
SES 3	28 (62)	8 (36)	17 (38)	14 (64)
Total	98	78	52	72

Source: Calculated from survey data. Chi square, Kodungallur = 0.360

Chittur = 9.95

Chi square test was employed for two divisions separately to find out whether there is dependency between SES class and the rate of utilization of PHC. The computed value of chi square for Kodungallur Division (0.360) was found to be non significant indicating the independence of SES class on rate of utilization. But in the case of Chittur it was found to be significant (9.95) at 1 % level. Hence the rate of ustilisation depends on SES class in Chittur. From the Figure 8.2, it is clear that rate of utilization of PHC decreases from lower class to upper class in Chittur Division, where as in Kodungallur such difference is not seen.
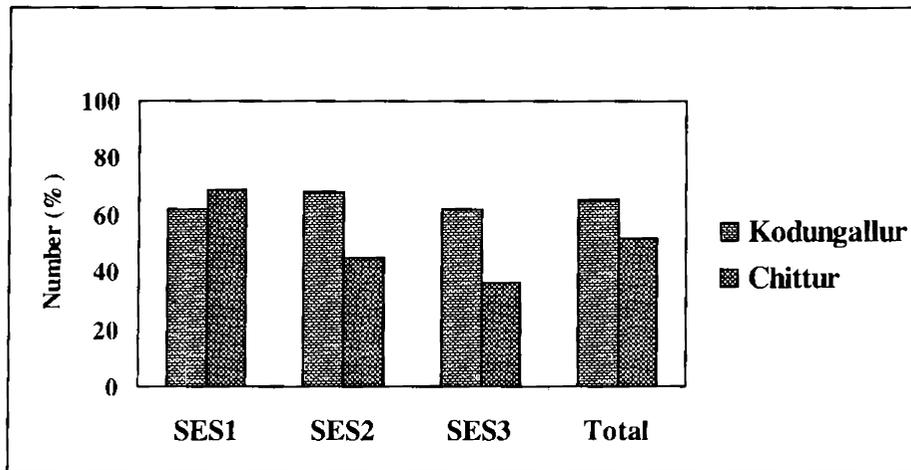
Figure 8.2. Rate of Utilization of PHC in two Division

8.2.3. Reasons for not Availing Primary Health Centers

Nearly 1/3rd of the sample population even from the lower group has not availed any services points out so many lacunas in their workings. To shed light on the real problems, this study has looked into the reasons for not availing the services of health center. Of the total number of reasons given, 73 % in Kodungallur reported distance as a major reason. They had private institutions in the vicinity of their homes. Since the main health center is located in Azhicode (Eriyad panchayat) people residing in other Panchayats had to walk a long distance to reach there. Though sub centers are there in Methala, and Edavilangu, panchayaths, they did not prefer to go there since doctor is available only in the morning session. For 9 %, the reason was that there was no treatment. About 6% felt that there was no medicine and so no confidence. Five percent reported non-availability of doctor as the reason for not going there (Table 8.9). Another factor noticed was that some respondents were reluctant to reveal that they are availing the services of Government institution since it is provided to them freely and

availing the services of private is considered as a prestige. In Palakkad 46% reported non-availability of treatment, and 38 % reported non-availability of medicine as the major reason. Only 8 % reported distance, as the major reason in Chittur. Distance is not considered as a major problem in Chittur, where as in Kodungallur distance was a major hurdle in availing the services of health center. For 5 % in Palakkad non-availability of doctor was the reason for not opting health center. This shows the need for strengthening the working of sub-centers for higher rate of utilization.

Table 8.9.

Reasons for not Availing PHC

REASONS	Kodungallur		Chittur	
	NO	%	NO	%
No Medicines	8	6	58	38
No treatment	14	9	68	46
No doctor	7	5	8	5
Too far	110	73	12	8
Other reasons	2	1	4	3
No hygienity	-	-	-	-
No confidence	9	6	-	-
Total	150	100	150	100

Source: Survey data

Availability of doctors

A well equipped health facility, accessible and with doctors available, with minimum waiting time, with helpful staff, sufficient medicines provided with right

261

advice of how to administer can give higher rate of satisfaction to the clients. Availability of doctor and availability of medicines are the major factor that influences people in availing the services of a health institution. Efficiency with which these institutions serve people depends on the perception of the people related to their view on availability of doctor and availability of medicines. So, these aspects are discussed in this session. With regard to the availability of doctors, 64 % of the respondents in Kodungallur division were of the opinion that doctor is not available (Table 8.10). As against this, in Chittur, 24 % expressed non-availability of doctor. Seventy six percent of the respondents in Chittur were partially satisfied regarding the availability of doctor. Though 36 % showed satisfaction regarding the availability of doctors in Kodungallur, no one is satisfied with the availability of doctor in Chittur division. In both the divisions all the respondents pointed out the urgent need to make full time availability of doctor in the sub- centers. At present, doctor is available only in the morning session in these centers. They pointed out distance as one of the major reasons for not availing health centers. This made them to approach nearby private hospitals which are nearer, hygienic, and provide full time availability of doctors, medicines and better services also. Non-availability of a lady doctor is yet another problem which forced them to nearby private hospitals for problems related to pregnancy and delivery. For testing the association of the opinion to the block a chi square test was carried out. The calculated value of chi square is 209.26

greater than the table value (5.99) at 2 degrees of freedom and at 5 % level of significance. Hence we conclude that their opinion is associated with the block.

Table 8.10.

Availability of Doctor

Availability of	KODUNGALLUR		CHITTUR	
doctor	No	%	No	%
Available	54	36	0	0
Not available	96	64	36	24
Partially available	0	0	114	76
Total	150	100	150	100

Source calculated from survey data. $\chi^2 = 209.26$**

Availability of medicines

Opinion collected from the respondents regarding the availability of medicines revealed that people are not satisfied with the present availability of medicines. All respondents in both the divisions were of the opinion that only certain routine medicines are available from there. In case of costly medicines, all are requested to purchase it from outside for which they have to pay a big sum. This is another major reason for the people not to avail the services of health centers. The WHO (2001) had identified availability of medicine at the primary care level as the reason for the relatively better utilization of public health centers in the Southern States.

Chi square test was employed to find out whether there is any dependency between opinion regarding the availability of doctor and the divisions. The computed value of chi square (142.20) was found to be significant indicating that opinion depends on the division. Nearly half of the respondents were satisfied in Kodungallur (Table 8.11) and opined that medicines were available. But in Chittur, only 5 % were of the opinion that medicines are available and 71 % stated

that medicines are partially available. Seven percent of respondents in Kodungallur division did not known about the availability of medicine in the primary health centers. There is a general feeling among the respondents in Chittur division that they have to purchase entire medicines from outside and are not satisfied with the treatment given to them. For consultation, they visit doctors in their house by paying fees rather than availing a free service from the health centers. They believe that in case of free service, they will not get good service. When consulted with the staff of health centers, regarding the supply of medicines it was known that pharmacist had to keep separate records in case of costly medicines. So, usually, they are reluctant to purchase it and in case of routine medicines, they are not required to keep a separate account, they purchase only routine medicines. The differences in the response between the two regions regarding the availability of medicines may be due to the fact that the people in Kodungallur are more literate than their counter part in Chittur. They are aware of their rights to protest if the routine medicines are not supplied to them. For example, there was a report in Manorama daily on (22-12-01), stating that Aloor and Kodakara Primary health centers in Thrissur district were closed for some days because of inadequate staff and shortage of medicines. Though the health department sanctioned the fund to the health centers, the block Panchayat had not delivered the fund to the health centers and the working condition of that health center was in a deplorable condition and the people raised protest against that. Such response from the people of Palakkad may not be seen, since they are not bothered about their rights and to avail the privileges given to them. This proves the statement made by our Nobel laureate that "In Kerala, if a primary health center was manned for a few days, there would be a massive demonstration at the nearest collectorate, led by local leftists, who would demand to be given what they knew they were entitled to. This had the effect of making health care much more

rapidly available for the poor in Kerala. This account is in sharp contrast with the corresponding state of affairs in Uttarpradesh, where wide spread abscenteeism of Government doctors is passively accepted as a normal state of affairs"[2].

Table 8.11.

Availability of Medicines

Opinion of respondents	Kodungallur (%)		Chittur (%)	
Available	71	47	8	5
Not available	59	39	36	24
Partially available	11	7	107	71
Not known	11	7	0	-
Total	150	100	150	100

Source calculated from survey data. $\chi^2 = 142.20**$

Quality of medicines

As far as the quality of medicines is concerned, 55 % in Kodungallur division were satisfied with the quality of medicines. But in Chittur division, only 28% showed complete satisfaction and nearly 1/3rd of both the divisions were not satisfied with the quality of medicine (Table 8.12). The opinion about the quality of medicines by the respondents depends on the division. Calculated value of χ^2 (40.15) is greater than table value (5.99) at 5 % level. It was seen that people in the study area of Palakkad district did not have any confidence in the quality of medicines. Many of the respondents in that area reported that iron and vitamin

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[2] Amartya Sen On Kerala: National Conference on education in Kerala's Development. Towards a New agenda.Trivandrum 26-28 december 2000. Institute of social science.p-54

tablets are given to the pregnant women free of cost from the health center by the health workers. But, it was surprising to hear that some of them even throw away these medicines since they did not believe in the quality of it, though it was delivered to their house free of cost. Instead, they consult either private doctors or Government doctors in their homes and pay an amount, which is equally charged by the private doctors and then purchase the same vitamin and iron tablets from outside by paying a big sum from their pocket. This shows that people are quality conscious and health conscious and they are not reluctant to pay, provided they are getting proper services from the Government.

Table 8.12.

Quality of Medicines

Opinion	Koungallur (%)		Chittur (%)	
Satisfied	83	55	42	28
Not satisfied	41	27	42	28
Partially satisfied	20	13	66	44
Not known	8	5	0	-
Total	150	100	150	100

Source: Survey data χ^2=40.15**

On the whole, regarding the availability of doctors, medicines and utilization of health centers, Kodungallur division stands far ahead of Chittur division. Information collected from the field survey revealed that, degree of performance of health centers (any health care institution) depends to a great extent on the efficiency of the medical officers in charge of that institution. Second is the people's response to the provisions given to them. Active participation of the people in their working is essential for successful operation.

8.3. Opinion Regarding Working the of Primary Health Center

With reference to the opinion regarding the working of primary health centers in general, it has been seen that 35 % of the respondents in Kodungallur and 29 % in Chittur were fully satisfied. Only 12 % expressed complete dissatisfaction in Kodungallur where as 32% in Chittur expressed dissatisfaction. Percentage of people showing partial satisfaction in Kodngallur was 53 % as against 39 % in Chittur. On the basis of socio-economic classification, it was seen that more than half of the respondents in class 1 in Kodungallur were satisfied where as in Chittur also a little less than half say, 46 % were satisfied. In both divisions, around 1/4th of class 2 were satisfied. But in case of class 3 while 36 % expressed satisfaction in Kodungallur, only 9 % of that class in Chittur showed satisfaction (Table 8.13 and 8.14). Again, 12 % of lower group and 20 % of middle group in Kodungallur were not satisfied where as the corresponding figures in Chittur was 16 % and 34 % respectively. It is striking to note that no one in the upper class in Kodungallur showed complete dissatisfaction, as against this, 64 % of Chittur division showed complete dissatisfaction. It can be seen from the table that in both divisions, there is not much difference in case of class 1and 2. But the picture is entirely different, in case of upper class. Thus, in class 3 when 36 % showed complete satisfaction in Kodungallur, only 9 % in Chittur were satisfied.

Table 8.13.

Opinion Regarding Rorking of Primary Health Center (Kodungallur)

Class	Satisfied		Not satisfied		Partially satisfied		Total
SES 1	19	(56)	4	(12)	11	(32)	34
SES 2	18	(25)	14	(20)	39	(55)	71
SES 3	16	(36)	0		29	(64)	45
Total	53	(35)	18	(12)	79	(53)	150

Source: Survey data.   Chi square = 18.91**

Table 8.14.

Opinion Regarding Working of Primary Health Center (Chittur)

Class	Satisfied		Not satisfied		Partially satisfied		Total
SES 1	24	(46)	8	(16)	20	((38)	52
SES 2	18	(24)	26	(34)	32	(42)	76
SES 3	2	(9)	14	(64)	6	(27)	22
Total	44	(29)	48	(32)	58	(39)	150

Source: Survey data.   Chi square = 21.37**

Scaling technique was applied to test the performance of each SES classification in Kodungallur and Chittur Division. Total score of availability of doctor, availability of medicine, quality of medicine and opinion regarding the working of PHC was computed to get an overall performance of PHC. Analysis of variance was computed to compare average scores of primary health center in each SES group in each block. The results are given in Table 8.15.

Table 8.15.

Average Score of Primary Health Centers as Rated by Each SES Group in

Kodungallur and Chittur

SES CLASS	Kodungallur -Mean Value	Chittur -Mean Value
SES1	8.07	10.06
SES 2	7.43	7.81
SES 3	6.57	6.57
	F=3.661 * 5% sig	F= 25.190 **

Source: Survey data.

It was seen from the table that in both divisions, F value was found to be significant. First group having highest average score value indicates that SES 1 reported good performance of PHC than the other groups.

After computing the total score, the range of score is divided into three classes,

1. PHC having poor performance (Those having a total score < 7)

2. PHC having average performance (Those having a total score ≥ 7 and ≤ 9)

3. PHC having high performance (Those having a total score ≥ 10)

Total score computed is divided into three groups viz, lower, middle and higher.

Table 8.16.

Performance of PHC as given by each SES classification in Kodungallur

SES CLASS	Lower	Middle	Higher	Total
SES 1	4 (12)	6 (18)	24 (21)	34 (100)
SES 2	22 (33)	26 (39)	19 (28)	67 (100)
SES 3	27 (55)	19 (39)	3 (0)	49 100)
Total	53 (35)	51 (34)	46 (31)	150 (!00)

Source: Survey data.

Table 8.17.

Performance of PHC as given by each SES classification in Chittur

SES CLASS	Lower	Middle	Higher	Total
SES 1	10 (19)	28 (62)	10 (30)	54 (100)
SES 2	22 (30)	32 (43)	20 (27)	74 (100)
SES 3	6 (27)	15 (73)	-	22 (100)
Total	38 (25)	76 (51)	36 (24)	150 (100)

Source: Survey data.

A two way table representing performance classification and SES classification were computed and chi square test was employed to test whether there is any significant association between these performance classification and SES classification. Chi square value for Kodungallur is 41.752 and for Chittur is 796 which is greater than the table value 9.49. Chi square test also confirms the results that there is association between the performance rating given to the PHC and the SES class of the respondents.

Felt Needs

More than 75 % of the respondents of Kodungallur expressed the view that primary health centers are able to meet all the felt needs of all types of diseases. But in Chittur, less than 5 % were of the opinion that health centers are able to meet the felt needs.

Table 8.18.

Felt needs in two blocks

Whether PHC able to meet felt needs of all types	Kodungallur (%)		Chittur (%)	
Yes	114	76	7	5
No	36	24	143	95
Total	100	100	100	100

Source: primary data

8.4. Maternal and Child Health Care

The health status of any country, to a great extent is directly related to the care given to the women and children. Maternal and child care is an integral part of primary health care provision. Improvement in women's health status is not possible, unless basic health needs are met and comprehensive, integrated and holistic health care available at affordable cost within easy geographical reach. Primary health centers are the core of the institutions that are expected to provide maternal and child care services to the rural poor at an affordable cost. Performance of these institutions in providing maternal and child health services to the people is also estimated through field survey. The variables included to

evaluate these services are place of delivery, type of delivery, complications of delivery, birth weight, immunization status, etc.

8.4.1. Delivery characteristics

Place of delivery

An important component of health care services of mothers and babies are the provision of proper medical care at the time of delivery. This will reduce the risk of complications and infections that can seriously affect the health of mother and the new born. Childbirth in hospitals is an important behavioral variable. which has contributed to improved child survival figures in Kerala. Previous studies also indicate that 97 % of deliveries are arranged in hospitals (Aravindan. 2001). The respondents in our survey were asked to report the place of delivery during the survey period. Results of present study from the selected area are shown in Table 8.19.

Table 8.19.

Place of delivery By SES

Social Class	Government		Private		Home	
	KODU	CHITTU	KODU	CHITTU	KODU	CHITTU
SES 1	24 (71)	24 (46)	10 (29)	12 (23)	0	16 (31)
SES2	30 (42)	52 (68)	41 (58)	24 (32)	0	0
SES3	3 (7)	8 (36)	42 (93)	12 (55)	0	2 (9)
Total	57 (38)	84 (56)	93 (62)	48 (32)		18 (12)

Source: Survey data: Chi square: Kodungallur = 34.62   Chittur = 33.84

272
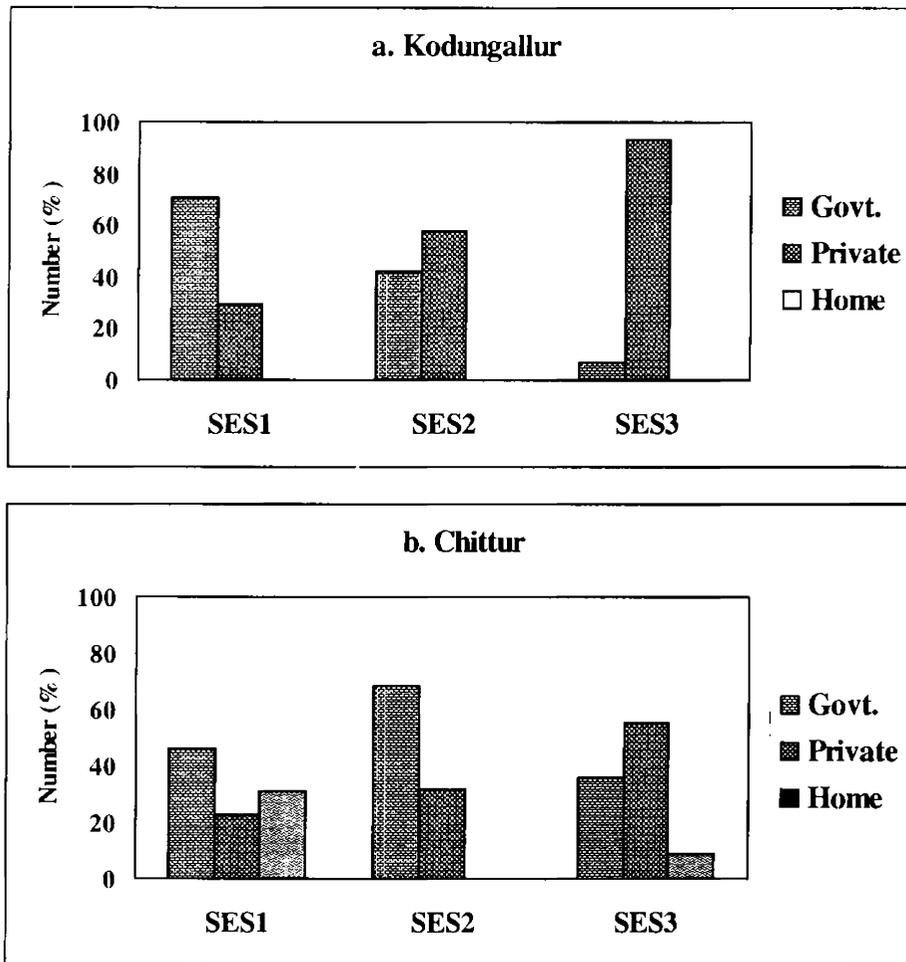
Figure 8.3. Place of delivery by SES classes in each division

It was striking to note that as against the 100 % institutional delivery in Kodungallur division, Chittur division reported only 88 % institutional delivery, which is lower than the state average. No delivery was conducted in primary health centers in both divisions during the study period. It was seen that, while 62 % households approached private hospitals in Kodungallur division for delivery, only 32 % opted private hospital in Chittur division. In Chittur division, 56 % opted Government institutions and 32 % opted for private institutions.

Twelve percent of respondents in Chittur division opted for home delivery whereas no one in Kodungallur opted for home delivery. 31% of SES1 classes and nine percent of the SES 3 classes conducted home delivery in Chittur Division. Moreover, five percent of the home delivery was conducted by the family members itself i.e. without the assistance of trained personnel. Survey revealed that among the lower income group, 71% availed Government institution and 29 % private institution in Kodungallur division. For the other groups, 58 % of the second and 93 % of the third group availed private institution. As against this, in Chittur, 31 % of the lower group conducted home delivery and 46 % availed Government service. In the SES 2 class of Chittur division, 68 % opted for Government institutions and 32 % opted for private institutions where as in SES 3 classes, 36 % opted for Government institutions and 55 % opted for private institutions. From the Figure (Figure 8.3) it is clear that rate of utilization of Government institutions in Kodungallur division decreases from lower class to upper class and that of private institutions increases. But in the case of Chittur Division, there is an increase in rate of utilization of Government institutions in SES2 classes than SES1 classes this is because 31 % of the SES1 classes opted for home delivery. Rate of utilization of private institution is increasing from lower to higher classes in Chittur division also. In both divisions, higher rate of utilization of private institution can be seen among the higher group. Higher rate of institutional delivery is considered to be one of the major reasons for having lower rate of parental mortality in Kerala. There is striking difference between these two areas in case of place of delivery conducted. Chi square test was employed for each division to test the dependency of SES classes with the place of delivery opted. Computed value of Chi square for both the Kodungallur (34.62 with 2 degrees of freedom) and Chittur Division (33.84), with 4 degrees of freedom) was found to be significant at 1 % level of significance indicating the

strong association between place of delivery and SES classes. This proves that the use of maternal health service is strongly associated with the level of classes in both the divisions. Government institutions are supposed to give free service to the clients. In this context, it is surprising to see that nearly $1/3^{rd}$ of the poor in both the divisions, availed private institution for delivery. In our study even the third group was not very rich, but, just above the minimum level. In this class, utilization of private was 93 % among this group in Kodungallur and 55 % in Chittur. It is clearly indication of inefficiency and in effectiveness of Government institutions. When asked about the reason for their preference for private, it was informed that in the Government hospitals despite claiming free service, they have to procure entire medicines from outside by paying money. Moreover, bribery is rampant in Government institutions. Each and every one should be paid a good amount. For proper care they should consult the doctor in his home and should pay a good amount, which is not less than the private doctors. So, total expenditure will be more or less equal to the private. On the contrary, in private, they are getting better services, proper care and it is neat and clean. .

Type of delivery performed

The type of delivery performed is another indicator of the maternal and childcare provided to the people. Details regarding the type of delivery performed among the sample units reveal that more than $1/3^{rd}$ of the delivery in Kodungallur came under cesarean as against the figure of 16 % in Chittur (Table 8.20). As per one study conducted by Kunnikannan (2000), there was an increasing tendency towards cesarean type deliveries recently both in private as well as Government hospitals in Kerala and the cesarean section went up from 11.9 % in 1987 to 21.4 % in 1996. As per the World Health Organization norms no region in the

275

world is justified in having a cesarean rate higher than 10-15 %. Cesarean rate of 32 % in Kodungallur is really higher than the WHO norms which needs due attention. In most developed and developing countries the rate of cesarean section is much lower than in Kerala. It is said that Cesarean sections are some times performed for other than maternal or fetal well being, such as avoidance of patient pain, patient or provider convenience, or provider financial incentives. Thus higher rate of utilization of private institution for delivery among the people of Kodungallur may be the reason for higher rate of cesarean delivery than in Chittur. To know whether such relation exist between place and type of delivery, both are combined and tabulated in Table 8.21. The dependency of SES class and type of delivery in each division were tested by using chi square test. Computed value of chi square in Kodungallur (0.45 with degrees of freedom = 2) and Chittur divisions (5.08 with degrees of freedom = 2) were found to be non significant. This implies that there is no dependency between SES classes and type of delivery.

Table 8.20

Type of Delivery Performed

SES group	Normal		Cesarean	
	KODU	CHITTU	KODU	CHITTU
SES 1	23 (68)	48 (92)	11 (32)	4 (8)
SES 2	50 (70)	62 (82)	21 (30)	14 (8)
SES 3	29 (64)	16 (72)	16 (36)	6 (28)
Total	102 (68)	126 (84)	48 (32)	24 (16)

Source: Survey data. Chi square value Kodungallur = 0.45, Chittur 5.08

Table 8. 21.

Type and Place of Delivery Combined

Type	Place of Delivery				
	Government		Private		Domiciliary
	Kodung	chittur	Kodungallur	Chittur	Chittur
Normal	40 (70)	68 (81)	62 (67)	40 (83)	18
Cesarean	17 (30)	16 (19)	31 (33)	8 (17)	0
Total	57	84	93	48	18

Source : Survey data. Chi square: (Kodungallur) = 0.19; (Chittur) = 4.02

It was seen from the table that in Kodungallur 70% of the total delivery conducted in Government hospital is normal and 30 % cesarean, where as in Chittur it is, 81 % and 19 %. The same figure for private hospital is 67% and 33% for Kodungallur and. 83 % and 17 % for Chittur. There is only marginal difference between the proportion of cesarean delivery conducted in private and Government hospitals in both the divisions. Thus, we cannot deduct that higher proportion of cesarean in Kodungallur is due to higher rate of utilization of private institution. This result is again confirmed using chi square test. The chi square statistic computed for Kodungallur (0.19 with 1 degrees of freedom) and for Chittur (4.02 with 2 degrees of freedom) are found to be non significant indicating that there is no dependency between the type of delivery and place of delivery. Higher proportion of cesarean section particularly in the Government sector remains to be studied in detail. It is informed that doctors are reluctant to wait and take risk in Kodungallur. So, to avoid complications and risks, they immediately conduct cesarean delivery. This may be the reason to have higher rate of cesarean delivery

277

both in Government and private hospitals in Kodungallur. There will be sharp reactions from the public if mishap happens to mother or child, since people are more educated and exposed. As the people in Chittur are more timid, there will nott be any such violent reactions from the patient's of Chittur and they will take it as 'fate'. So, doctors will be willing to wait and take a little 'risk' to avoid cesarean.

Expenditure on Child Birth

Expenditure data on childbirth collected from the sample unit showed higher and increasing expenses as we move to the social class since proportion availing private institution are higher among higher classes. The average expenditure for delivery in private for normal delivery was Rs.4500 and for the same in Government hospital were around Rs.3000 in Kodungallur. Again, for cesarean it was Rs.10000 in private and Rs.5000 in Government hospitals. In certain complicated cases the rate went up to 50000. Chittur division shows a little lower rate when compared to its counter parts in Kodungallur (Table 8.22). Thus the average expense for normal delivery in private in Chittur is around Rs 3000 where as in Government hospital it is Rs 2500. For cesarean, the rate was Rs 7000 and Rs 3500 respectively. In case of normal delivery, the difference between private and Government hospital is only marginal in both divisions. But for cesarean, two divisions show noticeable difference between private and Government institutions.

Table 8.22

Average Expenditure on Delivery

Type of delivery	Kodungallur		Chittur	
	Private	Govt	Private	Govt
Normal	4500	3000	3500	3000
Cesarean	10000	5000	7000	3500

Source: Survey data

Age at the time of delivery

Age at the time of delivery is significant because it has an important bearing on the health of mothers and children. Shanty Ghosh (1998)[3], states that age at the time of delivery is one variable that affects infant mortality rate (Table 8.23).

Table 8.23.

Age at Marriage and Infant Mortality Rate

Age at marriage	Rural		Urban	
Below 18	141	41.7	78	41.1
18-20	112	33.1	66	34.7
Above 20	85	25.1	46	24.2

Source: Shanty Ghosh (1998)

Both teenage as well as late pregnancies are harmful for the health of mother and baby alike. The major life threatening complications for very young mothers are pregnancy induced high blood pressure, anemia and difficulty in

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[3] Dr. Shanti Ghhosh (1998). *Women's Role In Health and Development* Health education in South East AsiaVol:X111 NO: 273 April July 1998.

delivery due to disproportion between the pelvic size and the head of the baby. Pregnancy induced high blood pressure is a special hazard. It occurs more during the first pregnancy and the incidence is five times higher in the age group below 15 years than in the age group 20-24 years. In addition, there is a definite relation between the age of mother and the fate of the child. Infant mortality are greater when the mother is either very young (below 19) or relatively older (over 30).

Data related to age at the time of delivery was collected from the households and the results are presented in Table 8.24 & 8.25. It is seen from the table that for nearly 30 % of the respondents in Chittur, age at the time of delivery was below 20 years, where as in Kodungallur, no delivery was performed at the age below 20. It was seen that in Kodungallur, 76 % of the delivery among the sample population during the survey period was between the age group 20-25, 23 % between the age group 25-30, and only 1% above 30. As against this, in Chittur, only 67 % were in the right age group (20-25 & 25-30) at the time of delivery during our survey period. Thus, in Kodungallur, 99 % of the delivery was at the proper age 20-30 (as per the biological norms). With regard to SES classifications, it is seen that, among the SES1, in Kodungallur, 74 % of the delivery was between the age group 20-25, where as for SES 2, 82 % come under this category. As against this, in Chittur the same figure is 27 % and 64 % respectively. With regard to SES 3 group in Kodungallur division, 67 % is in between 20-25 and 33 % in between 25-30. It is seen that in Chittur, marriage and delivery takes place at the earlier age than in Kodungallur.

Table 8.24.

Age at the Time of Delivery (Kodungallur)

Age at the time Of delivery	SES1		SES2		SES3		TOTAL	
Below 20	-		-		-		-	
20-25	25	(74)	58	(82)	31	(67)	114	(76)
25-30	9	(26)	11	(15)	14	(33)	34	(23)
30-40	0		2	(3)	0		2	(1)
TOTAL	34		71		45		150	

Source: Survey data

Table 8.25.

Age at the Time of Delivery (Chittur)

Age at the time of delivery	SES1		SES2		SES3		TOTAL	
Below 20	26	(50)	14	(18)	4	(18)	44	(30)
20-25	14	(27)	48	(64)	14	(64)	76	(51)
25-30	8	(15)	14	(18)	4	(18)	22	(16)
30-40	4	(8)	0		0		4	(3)
TOTAL	52		76		72		150	

Source: Survey data

Complications during delivery and pregnancy

Pregnancy and delivery of women is a complicated process. During pregnancy and delivery some women are prone to some health problems. The symptoms commonly found during pregnancy are swelling of hands and feet, paleness, weakness or tiredness, dizziness, bleeding, weak or no movement of fetus etc. Premature labour, long periods of labour, breech presentation and

281

obstructed labour are some of the common problems during delivery. In this survey, the respondents were asked whether she had any complications during pregnancy and delivery.

Survey reveals that in Kodungallur, nearly 50% of the samples expressed complications during pregnancy and delivery, where as in Chittur only 16 % have complications. Again, while, 44 % reported complications among SES1 in Kodungallur, 71 % reported complications among SES3 in the same area. Corresponding figures in Chittur region is 4 % and 55 % respectively. Thus, in both the areas proportion of complications are higher among higher socio economic classes. Swelling of hands and feet during pregnancy is seen higher in Kodungallur. Moreover, this complication is greater among women from higher socio economic groups. It may be due to the fact that higher socio-economic category women may lack ample physical exercises and this can be a reason for the higher proportion in swelling during pregnancy among them. Paleness is found higher in Chittur compared to Kodungallur. But, comparing socio-economic differentials in Chittur the proportion of women having paleness is higher among the higher class. Abnormal presentation of the baby is another problem seen in these two areas, though Kodungallur stands ahead. About a quarter of women in Chittur and 65 % of women in Kodungallur reported other complaints like vomiting which is very common during pregnancy. Among the higher socio-economic classes, proportion of women who experienced complications during delivery are found higher compared to the middle and lower classes. Four cases of kidney problems were also reported in Kodungallur. High blood pressure is another major problem seen in Kodungallur. Another striking thing was that. in Kodungallur more than 70 % of the samples were advised to take bed rest during pregnancy. Eight percent of women reported other complications like breech

presentation. Prolonged labour is another complaint reported in Kodungallur during delivery (Due to poor uterine contractions, the cervix may dilute slowly. If the labour exceeds 12 hours or more, it is treated as prolonged labour). Palakkad samples show that 6 % of women have prolonged labour delivery while a lesser per cent is seen in Kodungallur. Chi square test was employed to compare birth complication between SES classes of each district. Chi square value computed in the case of Kodungallur was 12.53 and that in the case of Chittur was 30.4923. Each of them was greater than table value (5.99) at 2 degrees of freedom. This indicates that in both the study areas birth complications are associated with the SES classes.

Table 8.26.

Birth complication (Kodungallur)

Table 8.26

Birth complication (Kodungallur)

SES class	YES	NO	TOTAL	
SES1	15 (44)	19 (56)	34	
SES2	27 (38)	44(62)	71	
SES3	32 (71)	13 (29)	45	
TOTAL	74 (49)	76 (51)	150	

Source: Survey data, chi square value=12.5388

Table 8.27.

Birth Complications Chittur

SES class	YES		NO		TOTAL
SES 1	2	(4)	50	(96)	52

283

SES 2	10	(13)	66	(87)	76
SES 3	12	(55)	10	(45)	22
TOTAL	24	(16)	126	(84)	150

Source: Survey data, chi square value= 30.4923
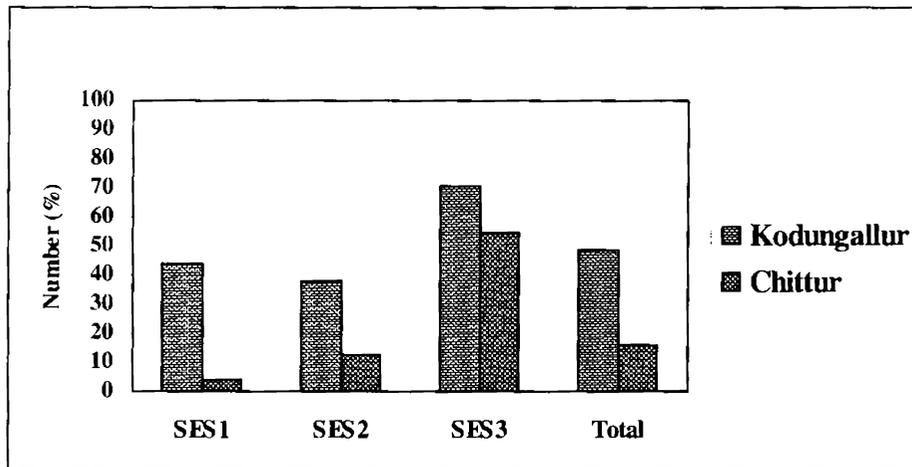
Figure 8.4. Birth Complications in Percentage Reported from the Two Areas

Birth weight

Percentage of low birth weight babies is an indicator of maternal and child health care. Previous studies indicate that Kerala still lags behind other countries in health comparison in terms of survival norms. Birth weight of babies among the sample from both divisions was worked out and it was seen that percentage of low birth weight babies in Kodungallur block was 12.37 whereas it is 23 % in Chittur division (Table 8.28). Average birth weight in Kodungallur division is 3.00 and Chittur division is 2.8. Analysis on birth weight babies by SES shows that birth weight increases as we move to higher classes and again percentage of low birth weight babies are also higher among lower income strata in both divisions. When looked into the general reasons for low weight babies, it was seen that one major

cause of low birth weight is mal nutrition, not only during pregnancy, but also even before that. It has been observed that mother who was adequately nourished during her own growing up years has an excellent chance of delivering a normal size baby even if she has taken inadequate diets during her pregnancy. An increase in birth weight would lower the peri natal and neo natal mortality.

Table 8.28.

Percentage of Low Birth Weight and Average Birth Weight

Division	Low birth weight babies (%)	Average birth weight (kg)
Kodungallur	12.37	3.0
Chittur	23.00	2.8

Source: Survey data.

One of the most important variables affecting infant mortality rates, both directly and indirectly is socio-economic status. The availability and quality of health care and the nature of the child's environment are closely related to socio-economic status. Statistics reveal that infant mortality rate is the highest in the slums and the lowest in the richer residential localities. Major improvements in health status and a decrease in infant mortality require socio-economic development, including provision of health service. Our survey result also confirms the above findings showing inverse relation between SES class and birth weight. Birth weight of nearly 30% of the infants in both divisions is less than 2.5Kg among SES1. Again, 18 % of SES 2 and 27 % of SES 3 in Chittur divisions are low birth weight babies. This is another major issue that lies unsolved in maternal and childcare services in Kerala.

Table 8. 29.

Birth Weight by Socio Economic class

SES Class	KODUNGALLUR			CHITTUR		
	Average birth weight	% of birth Weight <2.5 Kg	% of birth Weight < 2 kg	Average birth weight	% of birth weight <2.5 kg	% of birth Weight <2 Kg
SES 1	2.5	29	10	2.4	30	15
SES 2	2.9	11	2	2.6	18	10
SES 3	3.3	3	-	3.1	27	7

Source: Survey data

Two way analysis of variance (ANOVA) was employed to compare the birth weight between Blocks and between SES classification and the results of ANOVA is presented in Table 8.30.

Table 8.30

Results of ANOVA for the Comparison of Birth Weight Between Blocks and Between SES Classification

Source	Degrees of freedom	Sum of squares	Mean squares	F
Block	1	0.0219	0.0219	0.086 ns
SES	2	0.390	0.195	0.766 ns
Error	262	66.700	0.255	
Total	265	67.126		

ns-non significant at 5 % level.

286

Results of ANOVA showed that there is no significant difference in the birth weight between two districts and between three SES classifications. Though, observed difference is seen in birth weight between the block and also between SES classes, it was found to be non significant statistically.

Antenatal visit

Home visiting is the backbone of all maternal and child health services of PHC. Even if the expectant mother is attending the ante-natal clinic regularly, it was suggested that she must be made at least one home visit by Health Worker Female or Public Health Nurse. More visits are required if the delivery is planned at home. The mother is generally relaxed at home. The home visit will win her confidence also. The home visit will provide an opportunity to observe the environmental and social conditions at home and also an opportunity to give pre-natal advice. The number of times ante-natal visits are made during pregnancy time by the health workers is a clear indication of the efficiency with which primary health centers serve their duties in providing maternal and child care services. Asked about the number of times home visits were made, during the last month prior to the survey, it was seen that 49 % of the respondents replied positively in Kodungallur, while only 17 % in Chittur replied positively. Home visits were made among 65 % of the SES 1, 49 % of the SES2 and 36 % of the SES3 in Kodungallur as against the 31 %, 13 % and 0 % in Chittur respectively for the same period. Chittur lags behind Kodungallur in case of home visits also in spite of 12 % home delivery which needs more attention.

Table 8.31

Antenatal Visits from PHC Kodungallur

SES Class	Yes		No		Total
SES1	22	(65)	12	(35)	34
SES 2	35	(49)	36	(51)	71
SES 3	16	(36)	29	(64)	45
Total	73	(49)	77	(51)	150

Source: Survey data, chi square=6.6088

Table 8.32

Ante-natal Visit from PHC Chittur

SES Class	Yes		No		Total
SES1	16	(31)	36	(69)	52
SES 2	10	(13)	66	(77)	76
SES 3	0	(0)	22	(100)	22
Total	26	(17)	124	(83)	150

Source: Survey data, chi square = 12.08886

To compare the ante natal visits among the SES classification a chi square test was employed in both the study areas. Chi square value computed is 6.6088 for Kodungallur and 12.089 for Chittur. Each of these chi square values is greater than the table value (5.99) at 2 degrees of freedom. This indicates that the opinion regarding ante-natal visit is associated with SES classification in both the study areas.

Information about the number and timing of visits made by mother's for ante natal checkup, according to various characteristics shows 85 % of births in Chittur and 99 % in Kodungallur, mother's made at least three ante-natal visits

implying the respondent's awareness of the need for antenatal care though Chittur division lags behind Kodungallur division. However, it may be noted that nearly 15 % of the mothers in Chittur made one or two visits only, i.e. less than the minimum recommended. Regarding the type of ante-natal care received among the mothers, 50 % in Chittur and 65 % in Kodungallur used private facilities. Type of ante natal care received and place of delivery are closely related. In Chittur, there are six women who have not gone for ante-natal check ups. But, in Kodungallur, all women have received antenatal care. The major reasons reported for not having ante natal care are 'did not feel the necessity (50 %)', 'and no time to go' (50 %). About 17 % of the respondents gave the reason as not aware of such antenatal care services provided by the Government.

Type of antenatal care availed

With regard to the type of institution opted for antenatal check up, it was again seen that as economic status increases, the use of private health facility increases obviously in both samples.

Table 8.33

Type of Institution for Ante Natal Care Kodungallur

SES class	Public (%)	Private (%)
SES1	54	46
SES11	28	72
SES111	10	90

Source: Survey data

289

Table 8.34.

Type of Institution for Ante Natal Care Chittur

SES class	Public (%)	Private (%)
SES1	65	35
SES11	38	62
SES111	15	85

Source: Survey data

It was again seen from the table that more than $1/3^{rd}$ even from among the lower income strata uses private facility for antenatal check up. Rate of utilization of private facilities for antenatal check up is higher in Kodungallur than in Palakkad.

8.4.2. Type of institution opted for family planning:

Information collected from the respondents regarding the type of institutions opted for female sterilization also reveals an increasing preference for private among higher income group in both divisions.

Table 8.35.

Type of Institution for Family Planning Kodungallur

SES class	Public (%)	Private (%)
SES 1	100	0
SES 11	65	45
SES111	32	68

Source: Survey data

Table 8.36

Type of Institution for Family Planning Chittur

SES class	Public (%)	Private (%)
SES1	100	0
SES11	45	55
SES111	31	69

Source: Survey data

Table 8.35 and 8.36 reveals that rate of utilization of public health facility was higher among the lower income strata. In addition to the free health care given to them, financial assistance was also given to them for under going sterilization in Government institutions.

8.4.3. Motivation for Doing it

It was again noticed that all women need not necessarily go for adoption of any family planning method on their own. There is a possibility that some one indirectly can motivate her to adopt these methods. It was seen that the main source of motivation for the acceptance of sterilization was self. i.e. women itself. They were not motivated by the financial incentives of the Government provided to them. At present, it was felt by the couples to control the family size for giving better amenities to the existing children. It seems, therefore, logical to limit the incentives to most needy group so as to reduce the financial burden of the Government.

291

8.5. Summary

Field survey conducted among the people of Kodungallur and Chittur Block shed light on the following inferences.

In both the divisions, degree of awareness is higher among lower strata and lower among higher strata. Z test applied indicates that thee is no significant difference in the proportion of degree of awareness between two blocks.

Though degree of awareness is higher in Chittur Dvision, rate of utilization is higher in Kodungallur than Chittur. Rate of utilization is higher among lower division and lower among higher division in Chittur, though Kodungallur does not show any such association. Socio economic variables play an important role in the rate of utilization of services.

Services of primary health centers mainly availed by the people in both the divisions are preventive in nature like vitamin tablets, iron and folic acid for pregnant women and immunization for infants and children. Less than 30 % of the people availed curative services. This shows that nearly $1/3^{rd}$ of the sample population even among the lower income group had not availed any services of primary health centers. With regard to the reasons for not availing the services of primary health centers, it was seen that distance was a major factor in Kodungallur where as non availability of medicines and treatment were the major hurdles that stands for non utilization of services.

There is significant difference between the blocks regarding the opinion of the people related to the availability of doctor. No one in Chittur was fully

satisfied with the availability of doctor. Sixty four percentage in Kodungallur were not satisfied with the availability of doctor.

All the respondents were of the opinion that only routine medicines are available in primary health centers. Nearly 1/3rd of both the divisions were not satisfied with the quality of medicines.

Thirty five percentages of the respondents in Kodungallur and twenty nine percentage in Chittur were not satisfied with the working of primary health centers. Again, people among the lower strata in both divisions expressed better performance of primary health centers than the higher strata.

With regard to the Maternal and Child Health Care services of primary health centers, it was seen that Kodungallur reported 100 % institutional delivery where as 12 % was home delivery in Chittur and 5 % of the home delivery was with out the assistance from trained personnel. Nearly 1/3rd among the lower income opted private institutions for delivery which is an indication of inefficiency and ineffectiveness of Government institutions.

More than 1/3rd of the delivery in Kodungallur and 16 % of the delivery in Chittur are cesarean. Statistically, no dependency was seen between type of institutions and type of delivery and type of institutions and SES classes.

In Chittur, marriage and delivery take place at an earlier age than in Kodungallur. Half of the respondents in Kodungallur and 16 % of the respondents in Chittur reported complications during pregnancy and delivery. In both the

divisions, there is a significant difference in birth complications between SES classes. It is higher among the women of higher socio economic groups.

Both divisions represent higher proportion of low birth weight babies than WHO norms. Present survey also confirms the previous findings that percentage of lower birth weight is higher among lower income than among higher income. With regard to the home visits made by the health workers, it was seen that Chittur lags behind Kodungallur in terms of home visits in spite of 12 % home delivery. Eighty five percentage of pregnant women in Chittur and 99 % in Kodungallur. made at least three ante natal visits. For antenatal visits, 50 % in Chittur and 65 % in Kodungallur availed private facilities.

CHAPTER 9

SUMMARY AND FINDINGS

Health is a critical factor in the development of any country. Health is man's greatest possession, for it lays a solid foundation for his happiness. A healthy community is the infrastructure to build an economically viable society. Disease pattern changes with modernization and industrialization. Health problems are being tackled by multi disciplinary teams - Public health and administrators, psychologists, sociologist, economists, and so on. Periodical evaluation of health care system from the point of view of beneficiaries is essential to assess the efficiency with which these institutions serve people. Primary health care being the most important and integral part of health care is to be evaluated properly and periodically so as to point out the problem areas and lacunas in the working of the system so that corrective measures can be implemented in future and make the system more efficient. Without having strong and efficient primary health care secondary and tertiary sector will not work. Hence, the present study is intended to examine the working of primary health care system and its impact on the health status of people.

Evaluation of primary health care system in this study was conducted by classifying the major elements of the primary health care into three; preventive, promotive and curative. The households selected for the study have been classified into three groups according to socioeconomic variables via: SES I, SES II and SES III representing lower strata, middle strata, and higher strata respectively. Kodungallur Block from Thrissur district and Chittur Block from Palakkad district were selected randomly for the study.

295

9.1. Preventive Measures

Preventive Measures relate to improving family welfare which includes 1. Family Planning and 2. Maternal and Child Care.

9.1.1. Family Planning

Both divisions recorded striking performance in terms of family planning programmes. Performance of Family Welfare Programme in terms of achievement of target in sterilization in Thrissur is impressive by far exceeding the target in most of the period under study. The highest rate of achievement was recorded during the year 1998-99. In Palakkad, the rate of achievement was below the targeted level except in 1998-99. During the last two years, Palakkad showed better performance than Thrissur.

Break up of sterilization into vasectomy and tubectomy showed one sided participation. Though vasectomy is simple, safer, less expensive, male participation was negligible in both the areas. Since 2002-03, there is a marginal increase in the number of male participation in Palakkad, though Thrissur recorded steep fall. Though Kerala stands with high female literacy and a favourable ratio and women enjoy a better position than else where in the country, male participation in this respect is nil as seen in other parts of the country.

Break up of female sterilization into different components like PPS, Minilap, and laproscopy showed that PPS is considered to be the most popular

method in Palakkad and Thrissur. In Thrissur, there is increasing preference for laproscopy.

Temporary Methods

A cursory glance at the annual target for intra-uterine (IUD) contraception device in Thrissur showed that achievement in IUD was less than the target in most of the period. Compared to the achievement in sterilization, this method has not much acceptance among the people.

Conventional Contraceptives

There has been steady decline in the number of conventional contraceptive users and contraceptive pieces distributed. As far as the use of contraceptive method is concerned both areas do not show much difference.

Oral Pills

Methods of Oral Pills seem to be the most unpopular one in the study areas in both the divisions.

9.1.2. Maternal and Child Health Care Programme

Maternal and child Health Care Programme includes TT pregnant women, BCG vaccination, DPT, Oral Polio, Measles, Vitamin A, DT, TT 16 years, IFA pregnant women. In Maternal and child Health Care Programmes, both divisions recorded significantly remarkable achievement by far exceeding the target during the study period. Evaluation of primary Health care system in

terms of preventive measures recorded remarkable progress during the study period.

9.2. Outcome Evaluation of Family Welfare Programme

Crude Birth Rate

Birth rate registered a steady decline in Thrissur and Palakkad. Though Palakkad recorded higher rate than Thrissur in the initial period, it reached a lower level than Thrissur at the end of the period. This indicates a satisfactory performance of family planning programmes in these areas.

Death Rate

In terms of Death Rate, performance of both the areas is impressive. Palakkad showed better performance compared to Thrisur. Thrissur division showed a marginal increase in death rate during the study period. It is doubtful whether the state can attain the target of 5 per thousand by 2010 if the present trend continues. This points out the need for giving attention to environmental factors.

Gross Fertility Rate

GFR in Thrissur recorded 57 % which is lower than the state average, though Palakkad showed a higher rate than Thrissur and state average.

Total Fertility Rate

TFR of Thrissur and Palakkad recorded 1.75 and 1.78 respectively, which is slightly higher than the state average, though lower than the ninth plan goal of 2.6 and National Population Policy Goal of 2.1. Thus, achievement of these two areas in terms of GFR and TFR is also satisfactory.

Couple Protection Rate

In terms of CPR, both divisions could not attain the target, but stands close to the National Goal.

Felt Needs or Unmet Needs

In terms of unmet needs, Palakkad showed better performance than Thrissur. Both divisions showed better performance than state average.

Infant Mortality Rate

Both divisions recorded a lower rate of Infant Mortality Rate (IMR) than the targeted rate of 2010, though compared to the developed nations it is higher. Again, in those regions, death rate is higher than IMR whereas in the study areas IMR is higher than death rate. In terms of IMR, Kerala leaves much to be desired.

Break up of infant mortality into peri natal, neonatal and post neo natal mortality reveals that in Thrissur, around 75 % of the total infant death occurred

with in one month and in Palakkad, all the infant deaths are within one month. Endogenous factors like malnutrition, maternal diseases, and low birth weight babies, intra-uterine or neo natal infections are supposed to be the major cause for it.

Still Birth Rate

Still Birth Rate in Palakkad recorded higher than State average and National average though Thrissur recorded lower rate.

Low Birth Weight Babies

Percentage of low birth weight babies is estimated to be 13.2 and 16.1 respectively in 1998-99 which is higher than the internationally accepted rate. Again the rate has increased to 23 % in Thrissur while Palakkad recorded a marginal decline to 14 % in 2001. In 2003, percentage of low birth weight babies in both the divisions worked out to be 18 %. It showed that in terms of nutritional status, our achievement is not satisfactory since birth weight is associated with endogenous factors.

9.3. Promotive Measures

Promotive measures include evaluation of water and sanitation provisions. Major source of water in Kodngallur is tap water whereas well water is the main source in Chittur. Eighty percentages of the respondents in Kodungallur complained about irregularity of water supply and 70 % were not satisfied with

the quality of water supply where as in Chittur 40 % reported irregularity of water and 20 % were not satisfied with the quality of water supply.

With regard to the sanitation facilities, 91 % in Kodungallur have septic tank facilities, where as in Chittur, only 15 % have toilet facilities. More than 60 %, even from among the higher income groups use open ground in Chittur. This shows income is not a major determinant of type of sanitation. This depends on health habits of people.

9.4. Curative Measures

Disease profile of the patients treated for various diseases in the government allopathic institutions recorded a steady decline in the morbidity of diarrhea, T.B, pneumonia, fever, STD, whooping cough, measles, chicken-pox and hepatitis B in both divisions. Respiratory diseases contributed the largest share of morbidity in both divisions, though Thrissur recorded 40 % increase and 20 % decline in Palakkad. With regard to the 'other diseases' which include chronic degenerative diseases in addition to the minor acute illness recorded a marginal decline in Trichur. In terms of morbidity though the rate per thousand hospital admissions though increased in absolute terms. Palakkad recorded steady increase in this disease during the period under study.

There has been steady decline in the in-patients and out-patients treated in the health centers in both the divisions. Rate of decline in in-patients is greater than the out-patients in both the divisions. This is in contrast to the higher rate of utilization of the private institutions related to in-patients and out-patients. This

shows lower and declining rate of utilization of primary health centers because of their poor quality performance.

9.5. Pattern of Morbidity

Disease profile of Kodungallur collected from the records of health centers recorded higher and increasing rate of diarrhea, respiratory disease, TB, and fever. Typhoid and malaria recorded declining rates. Chittur division recorded higher rate of nutritional deficiency diseases, chronic diseases like gastroenteritis, dysentery, TB, diabetics, bronchitis, ulcer stomach, intestinal infection, arthritis and heart diseases. Evidence of malaria, leprosy and typhoid fever indicate the need to strengthen the curative health care activity in these areas.

Morbidity data related to the private institutions in Kodungallur recorded higher rate of diarrhea, respiratory disease and hepatic B, heart disease and stroke. Respiratory diseases contributed major share of the disease. There is evidence of malaria, TB and typhoid.

Primary data collected from Kodungallur and Chittur divisions recorded higher morbidity in Chittur than Kodungallur. Both the divisions recorded significantly higher rate than national average and state average recorded by previous studies. In terms of both acute and chronic degenerative diseases, both divisions recorded higher illness prevalence than the previous studies conducted at national and state levels.

Increasing disease load in these areas points to the need for giving serious attention to the curative care facilities provided by the health centers.

In spite of wide network of public sector medical care institutions where medical services are supposed to be easily accessible and freely available, private expenditure on medical care worked out to be very high. Data related to the health expenditures incurred by the house holds recorded higher rate than the previous studies.

Rate of utilization of private health care institutions for curative care worked out to be very high. Again, it was striking to see that more that 50 % even from the lower division availed private facilities. This may be the reason for higher health expenditure reported by them.

Present study revealed that no one in these areas was covered under any type of health insurance.

It was surprising to see that all the respondents in both the divisions were not against charging user fees, provided, they are getting quality services. The present trend in the disease profile and attitudes of the people indicates people's preference towards private health care system. It clearly indicates that people in these areas prefer quality care than the cost they have to incur. Higher rate of utilization of private care in spite of higher cost indicates health consciousness of the people in these areas. There is much scope to increase the performance of public health care institutions by improving the quality of services provided by them.

Socio-economic classification of households showed high disparity between the actual poverty and the estimated poverty. More than 80 % of the house holds surveyed come under below poverty line as per government records (i.e. in their ration card). But, as per present study, on the basis of socio-economic variables, only 23 % in Kodungallur and 35 % in Chittur come under lower income strata. It clearly indicates that if BPL is measured strictly on the basis of socio-economic variables, percentage of people under BPL group can be reduced to 1/4th of the present estimates. Free services given by these institutions need to be strictly restricted to these groups alone. Middle income group may be given some concession in the rate of consultation fees or medicines etc. all others may be charged the same amount as charged by the private health care units. People residing in each locality may be given health cards denoting the grades of their socio-economic status and different types of privileges may be given to them as per their socio-economic status. Like wise, health insurance may be implemented in these areas to all the residents and the rate of payment may be charged on the basis of grades or category a house hold may come under. These policies may reduce the financial burden of the government and the additional revenue generated through user fees may be used to improve the quality performance of these institutions.

9.6. Operational Efficiency of the Health Centers

Operational efficiency of the health centers is measured in terms of awareness, availability, acceptability, accessibility, patient satisfaction etc.

Degree of awareness of the existence of primary health center is higher in Chittur division and lower in Kodungallur division. In both the divisions, degree

of awareness is higher among lower strata and lower among higher strata. Though degree of awareness is higher in Chittur division, rate of utilization is higher in Kodungallur than Chittur. Rate of utilization is higher among lower strata than the higher strata in Chittur.

Services of primary health centers availed by the people in both divisions are preventive in nature like vitamin tablets, iron and folic acid for pregnant women and immunisation for infants and children. It was surprising to see that less than one third of the people have availed curative services from primary health centers. Nearly one third of the sample population even from among the lower income have not availed any services of primary health centers. This shows that health care programmes of primary health centers are confined to Family Welfare programmes alone neglecting curative aspects in spite of the increasing disease burden in these divisions. This supports the first hypothesis that changes in the health profile require reallocation of resources of primary health care system.

Non-availability of medicines, doctors, treatment, distance and no confidence were the major reasons reported by the respondents for not availing any services from primary health enter. In Kodungallur, distance was reported as the major reason while Chittur, the reason was non-availability of medicines, and doctors. The need for full time availability of doctors especially lady doctors were reported by the entire respondents. This point to the need for making effective functioning of sub-centers. Instead of appointing specialists in these centers, appointment of more doctors with minimum qualification may increase the operational efficiency of these centers. Medical officers working in these centers with higher qualifications and experiences were not happy to work over

there with regard to their salary and other working environment. Appointing health workers from distant places also result in absenteeism. If they were given a chance of working nearest to their residence, work absenteeism of these workers may be reduced.

There is significant difference between the two blocks, regarding opinion of the people relating to the availability of doctors. No one in Chittur was satisfied with the availability of doctors while only a little more than half of the respondents in Kodungallur were not satisfied with the availability of doctors.

All the respondents in both the divisions were of the opinion that only routine medicines were available in primary health centers. Nearly one third of the people in both the divisions were not satisfied with the quality of medicines. It seems that increasing the availability of medicines may increase the rate of utilization of these centers.

All the respondents pointed out the need for strengthening the functioning of sub-centers by making full time availability of lady doctors. Effective functioning of sub centers by making full time availability of doctors may increase the rate of utilization of health centers

Nearly one third of the respondents in both the divisions were not satisfied with the working of primary health centers. Again, people among lower strata in both the divisions expressed better performance of primary health centers than the higher strata. There is association between the performance rating given to the PHC and the SES classes of the respondents SES1 reported good performance of PHC than the other groups

With regard to the MCH care services of primary health centers, it was seen that Kodungallur reported 100 % institutional delivery, whereas a little more than one tenth was home delivery in Chittur block and 5 % of home delivery was without the assistance from trained personnel. Nearly one third even among the lower income opting private institutions for delivery is an indication of inefficiency and ineffectiveness of government institutions. It is surprising to see that no delivery was conducted at primary health center level in spite of 12 % home delivery. Again, it was striking to see that more than one third of the delivery in Kodungallur and a little less than one fifth of the delivery in Chittur are cesarean. Statistically however, no association was seen between type of institutions and type of delivery and also type of institutions and SES classes. It was known from the study that the increasing trend in cesarean might be to avoid risk of patients and to safeguard the position of the doctors.

Birth complications during pregnancy and delivery recorded higher rate in both divisions.

In Chittur, marriage and delivery takes place at the earlier age than in Kodungallur. Half of the respondents in Kodungallur and 16 % in Chittur reported complications during pregnancy and delivery. In both the divisions, there is significant difference in birth complications between SES classes. It is higher among the women of higher SES groups. Both the divisions represented higher proportion of low birth weight babies than WHO norms. Our study also confirms that percentage of low birth weight babies was higher among lower income than higher income.

With regard to the home visits made by the health workers, it was seen that a little more than half of the respondents in Kodungallur and a little more than 4/5th of the respondents in Chittur, reported no visits by the health workers during the last month prior to the survey. This again indicated the ineffective working of the health workers. It was surprising to see that for 85 % of the births in Chittur and 99 % in Kodungallur, mothers made at least three antenatal visits. For antenatal visits, more than half of the respondents availed private facilities. It was seen that more than one third even from among the lower income strata availed private facility for antenatal check-up. Rate of utilization of private facilities for antenatal check-up is higher in Kodungallur than Chittur.

Type of institutions opted for by the respondents for female sterilisation also recorded increasing preference for private among higher income groups in both the divisions. Rate of utilization of public health facility for sterilization was higher among the lower income strata. In addition to the free health care given to them, some financial incentives were also given for those who undergo sterilization in government institutions.

Operational efficiency of the primary health care system, in terms of quality assessment of health centers and Maternal and Child Care programmes from the point of view of beneficiary survey, revealed operational inefficiency. This proves the third hypothesis that there is a significant decline in the operational efficiency of the primary health care system

It was again striking to see that the main source of motivation for the acceptance of sterilization was self, i.e. women itself. They were not motivated by the financial incentives which the government provided to them. At present,

the need for limiting the size of the family was felt by the couples themselves in order to give better amenities to their existing children. It seems therefore that there is much scope to limit the incentives to the most needy group so as to reduce the financial burden of the government and the same may be spent for quality assurance of the health centers. Again, it was seen that no sterilistion was conducted at primary health center level though previously sterilization was also conducted at primary health center level.

9.7. Conclusions and Recommendations

1. Strengthening of sub-centers and equipping the government health care institutions would be more effective for effective utilization of health care institutions.

2. Epidemiological monitoring system must be an integral component of primary health care to control major diseases and for prioritization of public health programmes.

3. Instead of appointing specialists in these institutions appointment of more doctors with minimum qualifications may increase the operational efficiency.

4. Appointing health workers from the nearest of their residence rather than appointing from distant places may reduce their absenteeism.

5. A significant portion of the resources must be targeted towards curative measures by subsidising and making available nutritional element for pregnant women. This may reduce the percentage of low birth weight babies, still birth rate and higher proportion of peri natal mortality since these rates are associated with endogenous factors like nutritional status of pregnant women.

6. Implementing user fees and health insurance may increase the quality of services and efficiency of primary health care system since majority is availing private services.

Considering the present changes in the health profile, traditional pattern of resource allocation should be altered to meet the urgent health care needs of the people. Preventive and promotive measures like health education for giving awareness among people to change health habits, diet pattern, life style etc. are to be developed. Proper diagnosis and treatment of the disease at the beginning of the stage itself may help to cure majority of disease. For that, Public health policy must ensure the primary health care as enunciated at Alma- Ata international Conference. At the same time Public health is not to be treated as the sole responsibility of the government. Active community participation is an essential means to attain the goals.

Government should control the growth and working of private sector by fixing limits to doctor's fees and other charges related to diagnosis and treatment of diseases to make it affordable to the common man. Strict measures must be implemented to collect detailed information related to the working of private health care system. Since health is recognized as a fundamental human right, the minimal basic objective of public health policy must be to ensure accessibility and affordability to primary health care for all.

9.8. Scope for Further Research

The present study could shed light on the need for prioritization of resources in the light of sub-optimal allocational pattern of the primary

healthcare components. An economic evaluation of these components of primary healthcare system will throw light on the optimum resource allocation pattern which may increase the operational efficiency of the existing system. An indepth study of morbidity profile of the state is to be made at micro level basis and allocation of both human and other resources should be made strictly to the resource needs of the region.

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314

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ANNEXURE 1

A Sketch Map
of
THRISSUR DISTRICT (KERALA)

MALAPPURAM

PAZANJI

HELAKARA

PALAKKAD

THRISSUR

AMBALLUR

KAVALAI

LAKSHADWEEP SEA

IRINJALAKU

Kodungallur

TAMIL
NADU

IDUKKI

ERNAKULAM
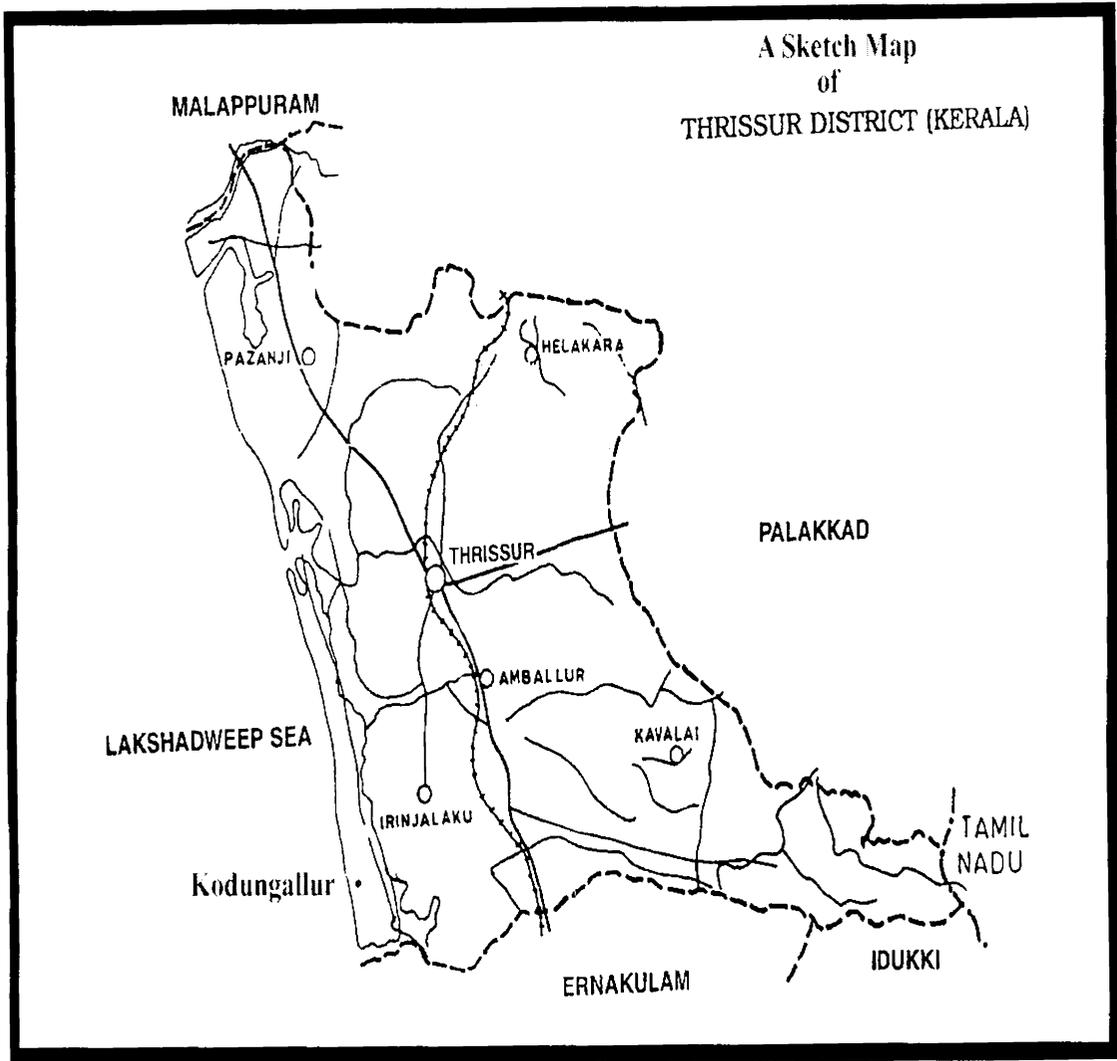
ANNEXURE 2

PALAKKAD DISTRICT (KERALA)

MALAPPURAM

TAMIL NADU

PALAKKAD

TRISSUR
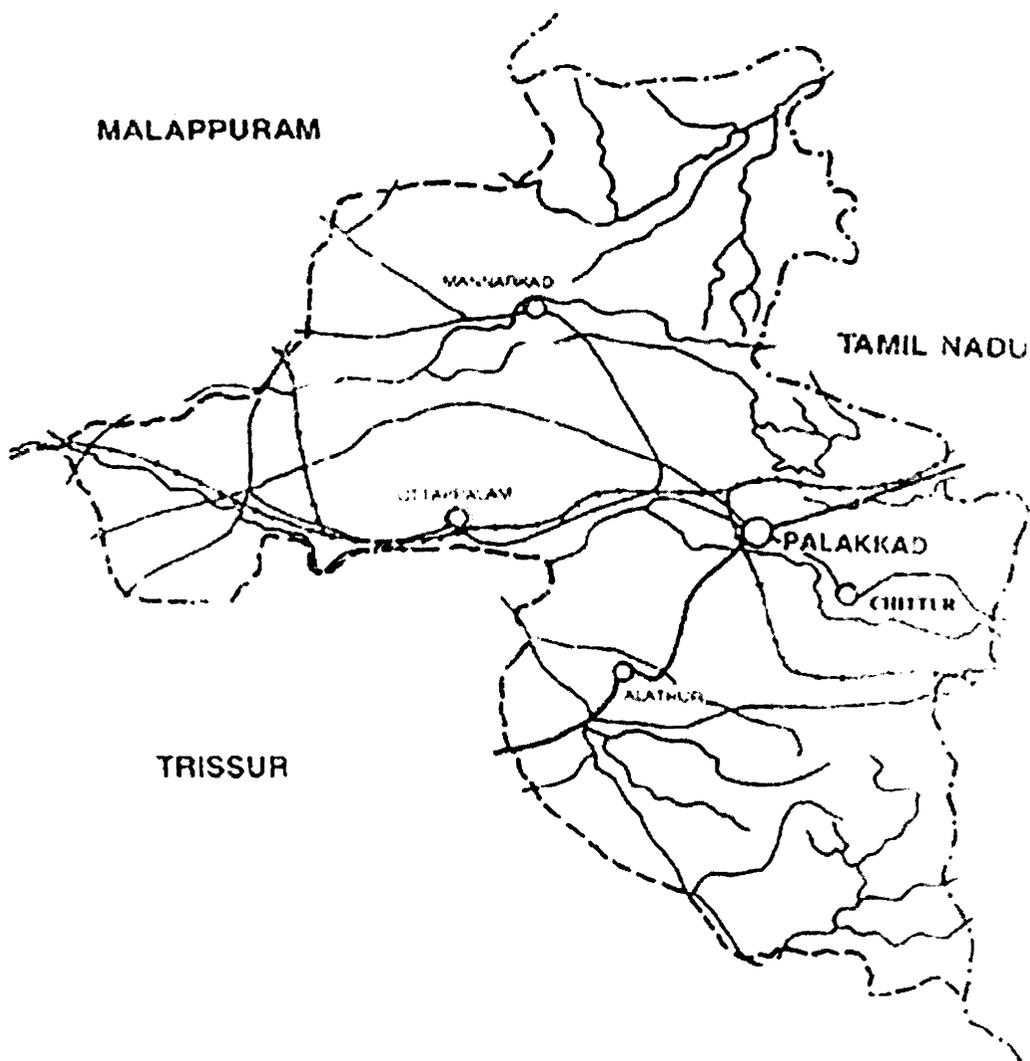
ANNEXURE 1.1

Health indicators of Kerala: district wise comparison

Districts	Percapita Income Rs	R	Literacy	R	Bed (pvt) /100,000	R	Hos (pvt):/ Sq:km	R	Bed(Govt) /100,000	R	Hos (Govt):/ Sq:km	R	AI
TVM	20439	6	89.36	9	153	10	1.97	4	220	1	0.52	2	5
KLM	19111	9	91.49	8	283	6	1.48	6	81	9	0.35	7	7
PAT	18183	12	95.o9	Q	359	3	0.97	7	77	11	0.23	12	7
ALP	19086	10	93.66	3	175	8	2.60	1	193	2	0.64	1	4
KTM	20827	4	95.90	1	402	1	2.15	3	177	3	0.38	6	3
IDK	21719	3	88.58	11	346	4	0.48	13	74	12	0.13	14	9
EKM	24399	1	93.42	4	382	2	2.25	2	131	6	0.47	3	3
TCR	20495	5	92.56	6	287	5	0.95	8	141	5	0.40	4	5
PGT	10898	13	84.31	14	81	14	0.40	14	80	10	0.24	11	12
MLP	14009	14	88.61	10	93	13	0.67	11	60	13	0.34	9	11
KKD	19606	8	92.45	7	130	11	1.59	5	154	4	0.40	5	6
WYD	23236	2	85.52	12	237	7	0.52	12	109	7	0.18	13	9
KNR	18622	4	92.80	5	162	9	0.89	9	86	8	0.34	8	7
KSG	20007	7	85.17	13	108	12	0.79	10	56	14	0.30	10	11
STATE	19463	-	90.92	-	216	-	1.10	-	122	-	0.32	-	-

Source: 1. Economic review (2002) Government of Keala. State Planning Board Trivandrum 2.Health Information Cell: Directorate of Health Service Trivandrum

ANNEXURE 4.1.

Estimated Live Birth Rate State Wise

Country/ State	1971-73	1981-83	1991	1992	1993	1994	1995	1996	1997	2000
India	36.3	33.8	29.5	29.2	28.7	28.6	28.3	27.5	27.2	25.8
Andra Pradesh	34.1	31.2	26.0	24.5	24.3	23.7	24.2	22.8	22.5	21.3
Assam	36.0	34.0	30.9	30.8	29.5	30.7	29.3	27.6	28.2	26.9
Bihar	32.3	37.9	30.7	32.3	32.0	32.5	32.1	32.1	31.7	31.9
Gujarat	38.6	34.3	27.5	28.1	28.0	27.1	26.7	25.7	25.6	25.2
Haryana	40.6	36.4	33.1	32.0	30.9	30.5	29.9	28.8	28.3	26.0
Karnaka	30.7	28.4	26.9	26.3	25.5	24.9	24.1	23.6	22.7	22.0
Kerala	30.5	25.6	18.3	17.7	17.4	17.3	18.0	18.0	17.9	17.9
Mayapradesh	38,6	38.2	35.8	34.9	34.9	32.8	33.2	32.3	31.9	31.4
Maharashtra	31.1	29.3	26.2	25.3	25.2	24.9	24.5	23.4	23.1	21.1
Orissa	34.7	33.5	28.8	27.8	27.2	28.0	27.8	27.0	26.5	24.3
Punjab	34.1	30.3	27.7	27.1	26.3	25.0	24.6	23.7	23.4	21.6
Rajasthan	40.9	38.5	35.0	34.9	35.1	33.7	33.3	32.4	32.1	31.4
Tamilnadu	31.3	27.9	20.8	20.7	19.5	19.0	20.3	19.5	19.0	19.3
Uttarpradesh	43.2	38.9	35.7	36.3	36.2	35.4	34.8	34.0	33.5	32.8
West bengal	-	32.5	30.3	28.0	28.6	28.1	26.1	25.3	24.8	20.7

Source: 1971-73 &1981-83 P.G.K. Panikar
Economic Survey, Various Issues

ANNEXURE 4.2.

Life Expectancy at Birth State Wise

	1991-96		2001	
	Male	Female	Male	Female
India	60.6	61.7	64	67
Andra Pradesh	61	65	63	65
Assam	59	59	59	61
Bihar	61	60	66	65
Gujarat	61	63	63	64
Haryana	65	64	65	69
Karnaka	64	65	62	66
Kerala	69	75	72	75
Madyapradesh	59	58	59	58
Maharashtra	64	66	67	70
Orissa	60	58	60	60
Punjab	67	67	70	72
Rajasthan	61	61	62	63
Tamil nadu	63	63	67	70
Uttar Pradesh	57	53	63	64
West Bengal	62	62	67	70

Source: Economic Review, Government of Kerala, Various issues;
Economic survey, Government of India

Annexure :6.1.

International Comparison of Health Man Power

Countries.	Physian per 000 population	Nursses per 000 population	Hospital per000 population
India	1.0	0.9	0.7
World	1.5	3.3	3.3
Low income	1.0	1.6	1.5
Middle income	1.8	1.9	4.3
High income	1.8	7.5	7.4

Source: Rajiv Misra , Rachel chatterjee and Sujatha Rao (2002): India Health Report
Oxford.p-19

ANNEXURE 6.2

Fertility indices in India and Southern States.

Year	AndraPradesh			Karnataka			Kerala			TamilNadu			India		
	GFR	TFR	GRR	GFR	TFR	GRR	GFR	TFR	GRR	GFR	TFR	GRR	GFR	TFR	GRR
1981	127.1	4.0	2.0	113.9	3.6	1.7	94.7	2.8	1.4	107.0	3.4	1.6	140.9	4.5	16
1985	122.2	3.7	1.8	122.2	3.6	1.7	83.9	2.4	1.2	94.1	2.8	1.4	138.7	4.3	2.0
1990	105.5	3.1	1.5	109.7	3.2	1.5	69.7	1.9	0.9	80.9	2.3	1.1	123	3.8	1.8
1992	96.1	2.8	1.3	101.7	2.9	1.4	62.0	1.7	0.8	77.2	2.2	1.1	118	3.6	1.7
1993	95.1	2.7	1.3	98.9	2.9	1.4	60.8	1.7	0.8	72.6	2.1	1.0	116	3.5	1.7
1994	93.0	2.7	1.3	96.9	2.8	1.4	60.2	1.7	0.8	71.2	2.1	1.0	118	3.5	1.7
1995	95.1	2.7	1.2	92.6	2.7	1.2	62.1	1.8	0.9	74.2	2.2	1.0	117	3.5	1.6
1996	88.9	2.5	1.2	87.6	2.6	1.2	61.7	1.8	0.9	70.4	2.1	1.0	112	3.4	1.6

Source: Women in Kerala 2001. Government of Kerala Directorate of Economics and Statistics Trivandrum

ANNEXURE 6.3

District wise Couple protection rate (CPR) and female reproductive age group

District	CPR
TVM	84.4
KLM	74.4
PTM	79.3
ALP	58.9
KTM	70.6
IDK	76.16
EKM	67.6
THR	68.1
PKD	61.88
MLP	51.59
KKD	61.7
WYD	68.02
KNR	61.19
KSG	52.3
Total	65.98

Source: Directorate of health Service, Trivandrum

ANNEXURE 6.4.

Percentage of effective couple protection rate as on 31st march 2001

States	By all methods	By sterilization
Andhra Pradesh	52.8	45.5
Assam	15.2	12.5
Bihar	21.2	16.7
Gujarat	52.8	35.4
Haryana	49.4	32.3
Karnataka	56.3	44.8
Kerala	39.6	34.5
MadyaPradesh	45.9	28.0
Maharashtra	49.3	40.0
Punjab	65.5	35.2
Rajasthan	36.1	22.9
Tamilnadu	30.4	39.3
Uttar Pradesh	38.0	17.3
West Bengal	32.2	27.2
Orissa	37.6	26.5

Source: Government of India 2002. Annual report 2001-02 Ministry of health and family welfare –New Delhi

ANNEXURE 6.5

Trichur

Years	Live Birth (No)	Still Birth (No)	Babies Weighing <2.5 kg (No)	Maternal Death (No)	One week Mortality (No)	One week to one month Mortality (No)	One Month To one Year Mortality (no)	One Year To5year Mortality (No)	Total Mortality
1999-2000	44905	180	7715 (17)	19 (0.4)	98 (57)	31 (18)	39 (22)	5 (3)	173
2000-01	45030	173	10046 (23)	10 (0.2)	89 (55)	38 (23)	34 (21)	2 (1)	`63
2001-02	49631	169	2901 (6)	8 (0.16)	79 (55)	36 (25)	22 (15)	6 (4)	`43
2002-03	3716	14	279 (8)	0	13 (45)	6 (20)	5 (17)	5 (17)	29

Source. Directorate of Healt Service trivandrum Monthly Bullettin on Family Welfare. Various issues.

ANNEXURE 6.6.

Palakkad

Years	Live Birth (No)	Still Birth (No)	Babies Weighing <2.5 kg (No)	Maternal Death (No)	One week Mortality (No)	One week to one month Mortality (No)	One Month To one Year Mortality (no)	One Year To5year Mortality (No)	Total Mortality
1999-2000	39961	291	4635 (12)	22 (0.5)	192 (64)	109 (34)	-	-	301
2000-01	40302	306	5479 (14)	25 (0.6)	172	46 (76)	70 (24)	1	289
2001-02	56675	286	4344 (8)	35 (0.6)	169	45 (71)	69 (23)	21	304
2002-03	3577	37	275 (8)	2 (0.6)	15	1	11	5	32

Source. Directorate of Healt Service trivandrum Monthly Bullettin on Family Welfare. Various issues

ANNEXURE 6.7.

Percentage of low birth babies1995-2000

Developed and less developed countries.

Country	% of low birth weight babies
India	26
Sri Lanka	17
Thailand	7
China	6
Bangladesh	30
Pakistan	21
USA	8
Singapore	8
Sweden	4
UK	8
Switzerland	6

Source: UNDP(2002) human development report. 'Depening Democracy in a fragmented world. Oxford University Press

2. government of India(2002). Annual Report 2001-2002. Ministry of Health and Family welfare New Delhi.

ANNEXURE 7.1.

Trichur: Disease profile

YEAR	DIA	Res	Tb	Fever	HB	WMC	STD	OTHER
1991	6.2	16.7	2.9	1.7	0.03	0.14	.0008	76.7
92	2.7	7.1	0.08	0.2	1.2	0.07	.005	89.7
93	5.6	17.5	0.7	0.2	0.03	0.078	.005	76.6
94	4.5	20.3	0.08	0.1	0.028	.05	.004	74.8
95	3.0	23.3	0.08	1.9	0.02	.037	.001	73.4
96	3.4	22.7	0.1	0.4	0.06	.094	.01	73.4
97	2.7	26.0	0.1	0.1	0.007	.019	.01	71.0
98	2.2	26.5	0.1	0.1	0.007	.019	-	71.0
99	2.5	31.0	0.07	0.1	0.003	.03	-	66.2
2000	2.3	34.3	0.05	0.13	0.002	.042	-	63.2
2001	2.4	28.8	0.05	0.2	0.004	.036	0	68.6
2002	1.4	23.4	0.06	0.8	0.003	.013	0	75.0

Source: District Medical Office, Thrichur

ANNEXURE 7.2.

Disease profile: Palakkad

YEAR	DIA	Res	Tb	Fever	HB	WMC	STD	OTHER
1991	11.2	20.4	0.5	0.2	0.1	0.9	0.27	67.4
92	12.9	22.7	0.6	0.02	0.1	1.2	0.48	63.2
93	8.0	15.6	1.1	0.1	0.1	0.80	0.07	74.7
94	9.2	18.9	1.0	0.9	0.09	0.4	0.34	70.6
95	5.7	10.9	0.7	0.08	0.03	0.6	0.07	82.4
96	8.7	5.7	0.7	0.2	0.04	0.7	0.20	81.9
97	5.0	8.7	0.6	0.07	0.5	0.07	0.24	78.1
98	1.8	4.59	0.1.	0.04	0.10	0.07	-	84.2
99	1.1	13.7	0.06	0.04	0.01	0.1	-	88.0
2000	1.2	10.6	0.2	0.02	0.02	1.12	-	83.0
2001	1,3	15.5	0.07	0.03	0.04	0.13	0.07	82.1
2002	1.0	16.3	0.05	0.02	0.03	0.05	0.04	89.0

Source: District Medical Office, Palakkad

Schedule for Household Survey

Code Number [_____]

1. Head of the family [_____]   4. Panchayat [_____]

2. House Name [_____]   5. Taluk [_____]

3. House Number [_____]   6. District [_____]

4. Details of Family members

No	Name	Relation with the Head of the family	Age Male/ Female	Whether married	Age of the time of marriage	Education	Job	Monthly Income
1.								
2.								
3.								
4.								
5.								
6.								
7.								
8.								
9								
10								
11								
12								
13								
14								
15								

5. Total income per month:

6. Religion   : 1. Hindu   2. Christian 3. Muslim

7. Education Status of Family members:

    1. No. of illiterates

    2. No. of members $\leq 7^{th}$ Standard

    3. No. of members having High School

    4. No. of members having > High School

8. Roof of the house   : 1. Grass/ Thatch, 2. Tile 3. Concrete

9. Type of Floor   : 1. Mud   2. Cement   3. Mosaic

10. Land Area   : 1. <11cents 2. 11-25   3. >25 cents

11. Type of Choola   1. Wood Burning
                              2. Smokeless Choola
                              3. Kerosene Stove
                              4. Gas Stove
                              5. Electric heater

12. Source of Drinking water 1. Own well   2. Other's wells
                              3. Pipe line,   4. Public tap
                              5. Filter tank   6. Others

13. Regularity of water supply   :   1. Regular   2. Not regular

14. Quality of water   1. Satisfied   2. Not satisfied

15. The safety of local source of water?   : 1.Yes   2. No

16. Whether boiled for drinking?   : 1. Yes   2. No

17. Excretion   :1. Open ground 2. Own compound 3. Septic tank

Maternal and Child Care

18. What were the circumstances of the last birth in the family?

19. What were the circumstances of the last birth in the family?

20. Were there any complications during pregnancy or delivery for the mother or the baby?   Yes/No

21. If yes, what were the complications?

22. What attention was provided?

23. Was pre natal care available for the last pregnancy?   Yes/No

24. How many prenatal visits were there and when did they occur?

25. During pre natal examination, if any, what procedures were conducted (blood pressure measurements, Urine analysis, physical examinations, etc.)?

26. Type of institution availed for pre natal checkup.

27. Did any body from PHC visit your home during the last month?
                             Yes/No

28. If yes number of times visited.

29. Details of Births from 1.2.2001 to 1.2.2002

Particulars	Individual cases in the family			
	1	2	3	4
1. Age at the time of delivery (1. Below 20 years, 2. 25 to 30 years 3. 30 to 40 years)				
2. No. of previous delivery				
3. No. of living children				
4. Place of delivery (1. Home 2. Private Hospital 3. Govt. Hospital 4. Others)				
5. Type of delivery (1. Normal 2. Cesarean 3. Others)				
6. Still born baby/Living baby (1. Still born 2. Living baby)				
7. Whether Mentally/Physically handicapped (1. Mental 2. Physical 3. Normal)				
8. If delivery at home, who attended the delivery (1.Midwife 2. Doctor 3. Family member 4. Others)				
9. What was the weight of the youngest baby?				
10. Expense for delivery (1. Below100 2. 100- 1000 3. 1000 - 2500 4. above 2500)				

30. No of Abortions

31. Did you adopt any family planning method? Yes/No

32. Which method is used?

33. Were there any difficulties?

34. Which institution is used for it?

35. What was the reason for opting that institution?

36. What was the motivating factor for adopting family planning method?

37. Did you receive any remuneration for adopting family planning method? (in case of government institutions) Yes/No

38. Did the remuneration attract you to adopt the family planning method?
Yes/No

39. How did you spend that money?

Operational Efficiency of Primary Health Centers

40. Do you know about the nearest Primary health center? Yes/ NO

41. If yes do you go there? Yes/ No

42. If no, reasons for not going there :
    1. No doctor   2.   No medicine   3.No treatment
    4. Too far   5.   No confidence   6. Other reasons

43. What type of services of primary health centers are availed by you?
1. Preventive . 2. Promotive   3. Curative

44. What are the medical services provided by the Primary Health Centers?

45. Are the doctors readily available for the immediate need of the people?
Yes/ no

46. Specify the approximate distance of the PHC from the village?

47. What is your opinion regarding the availability of doctors in PHC
1. Available 2. Not available 3. Partially available

48. Do you think that the medicines are readily available to the patients in the Primary Health centers?
1. Available 2. Not available 3. Partially available

49. What is your opinion regarding the quality of medicines in PHC?
        1. Satisfied 2. Not satisfied 3. Partially satisfied

50. Whether asked to purchase medicines out side? Yes/ No

51. Whether consulted private hospitals? Yes/ No

52. If yes state reasons:

In government hospitals
1.No doctor. 2. No medicines. 3. No treatment. 4. bribery . 5. lack of hygiene

 In private hospital
  1 nearer. 2. good behaviour and adequate attention in private hospital

53. Whether PHC is able to meet all the felt needs of the people?
        Yes/no

54. What is your opinion regarding the working of Primary Health centers?
        1. Satified. 2. not satisfied. 3. partially satisfied

55. Distance to the hospital to which usually going (Km)

56. Suggest measures to increase more efficient and effective utilisation of resources already available.

57. What extra facility do you expect in the Primary Health Centers?

58. Have you come across cases of discrimination in treatment against the poor?

        Yes/No

59. Are there cases of over crowding, long wait and rude behavior in the Primary Health Centre?
        Yes/No

60. Childcare

  a. Affected By following Diseases
  - i. Triple
  - ii. Polio
  - iii. BCG
  - iv. Measles
  - v. Whooping Cough
  - vi. Tetanus
  - vii. Measles
  - viii. TB
  - ix. Polio
  - x. Diphtheria
  - xi. Treatment given
    - 1. Allopathy   2.   Ayurvedic
    - 3. Homeopathy   4.   Others

61. Ailments (During last month)

Sl. No	Name of the diseases	No of days of Disease	Method for Treatment	Agency for Treament	Expenditure		
					Medicine	Fees	Others
1	2	3	4	5	6	7	8

Codes:
Column 2:
  1. Diarrheas   2. Fever   3. Malaria   4. Filaria5.   Chicken pox
  6. Measles   7. Mums   8. Diphtheria   9. Tetanus   10.Jaundice
  11.Typhoid   11.Asthma   13. Pneumonia 14. Heart attack 15. Paralysis
  16. Diabetes   17. Blood pressure 18. Goiter 19. Allergy   20. Others
Column 4
  1. Allopathy   2. Ayurveda   3. Homeo   4. Others
Column 5:
  1. Self treatment 2. Govt. Hospital   3. Pvt. Hospital   4 Others

61. Chronic Diseases

Sl No.	Disease	Duration	Treatment
1	2	3	4

Codes:
Column 2

1. Leprosy   2. T.B   3. Filaria   4. Asthma   5. BP
6. Heart attack 7. Cancer   8. Ulcer   9. Uterus disc 10. Kidney ailment
11. Arthritis   12. Goiter   13. Others

63. Total expense for Treatment in last month in Rs :

64. During the past 4 weeks, did you visit any public hospital/public health clinics/Private Doctor/Private Hospital to obtain outpatient health care?

Yes/No

65. Are your health care cost covered by any kind of insurance?

Yes/No

66. During past 4 weeks, did you visit any Private Nurse, Paramedical, and trained midwives to obtain health care?

Yes/ no

67. During the past 4 weeks, did you stay at a public hospital over night?

yes/ No

68. During the past 12 months, have you stayed at a public hospital over night?
Yes/ No
(If yes, how many days, & cost)

69. During the past 12 months, have you stayed at a Private Hospital?

Yes/No

70. Have you been asked to purchase & medicine from outside?

Yes/No

71. Have you been ever asked or forced to go to private Medical Practitioner?
Yes/No

72. Health Education

1. Have you got any information from the health visitor of PHC regarding health activities?

2. Action to be taken in cases of infant diarrhea

3. Which one you consider good for your baby?

(a) Breast feeding (b) Bottle-feeding.

4. What is your opinion of charging user fees in govt. hospitals?

5. If there any fees in government health care institutions/ / hospital, is it reasonable?
Yes/No

6. What is your Opinion about the working of Govt. health care institutions?

7. What additional facilities do you expect from these health care institutions for better performance and higher rate of utilization

xxi