CHAPTER - II

ENVIRONMENT AND ITS INFLUENCE ON HEALTH

2.1 INTRODUCTION :

The activities of man are controlled by the nature. The health status of an individual or of community are determined by the interplay and integration of two ecological universes viz. i) the internal environment of man himself and ii) the external environment which surrounds him (Park and Park,1979). In the modern concept, disease is nothing but a disturbance in the delicate balace between man and his environment. The key of the nature, occurance, prevention and control of the disease lies in the environment. Without this knowledge, this key may not be available to the Physician who desires to cure the disease, prevent or control it (Park and Park,1979).

There are several factors included in the physical environment namely physiography, drainage, climate and soil while socio-cultural environment consists of such factors as population growth, density of population, education, sex ratio, occupational structure, housing, agriculture, standard of living, food and diet, nutrition, religion, water supply, pollution, clothing, social customs, traditional habits and beliefs, poverty, ignorance etc. All these factors of physical and socio-cultural environment influence on man's health as well as on community health.

The researcher has attempted to analyse the effect of environment on the pattern of distribution of major diseases

in various districts of Pune division. The analysis made by the researcher in this chapter is based on the physical and socio-cultural factors which are responsible for the distribution of diseases in the six districts of Pune division.

These factors have been analysed districtwise and citywise for major diseases in general as main aim of the researcher is to concentrate his attention on the district-wise distribution of diseases.

It is difficult to collect all data about all depending variables of environment at district and city level. The researcher has selected some of the important aspects for his studies about which reliable and continuous data were made available.

2.2 PHYSICAL ENVIRONMENT :

Physical environment is main factor which effects the human life. Physical environment consists of non-living things viz. physiography, drainage, soil, climate etc. Man is the constant interaction with the physical environment. Physiography, drainage and climate are the dominant factors which affects the health of man.

2.2.1 Physiography :

The physiography determines the distribution of diseases in the area. Certain diseases are found at particular physiographic region. The effect of altitude on the spread of vectors of the diseases has certainly proved its co-relation. Region of high altitude due to it's low temperature, cold climate, clean air, and abundant sunlight do not allow to survive many disease vectors.

The Pune division is located on the south-western part of Maharashtra state. Physiographically this region can be divided into three parts, namely -

(i) The hilly area comprises of some part of Sahyadri, Mahadev hill and Harichandra Balaghat hills,

(ii) Plateau region - Some part of Deccan plateau

(iii) Lowlands - Krishna, Bhima and Panchganga river basin.

The part of Harichandra, Balaghat and Mahadev hills emerges in the western part of Sahyadri range. The slope of the Sahyadri decreases from north to south. Some part of the Sahyadri ranges passes through Pune division. The southern slopes of these ranges falls from a height of about 1200 meters to 300 meters and below. The range of the Mahadev hills has been located in Satara, Sangli and Solapur districts

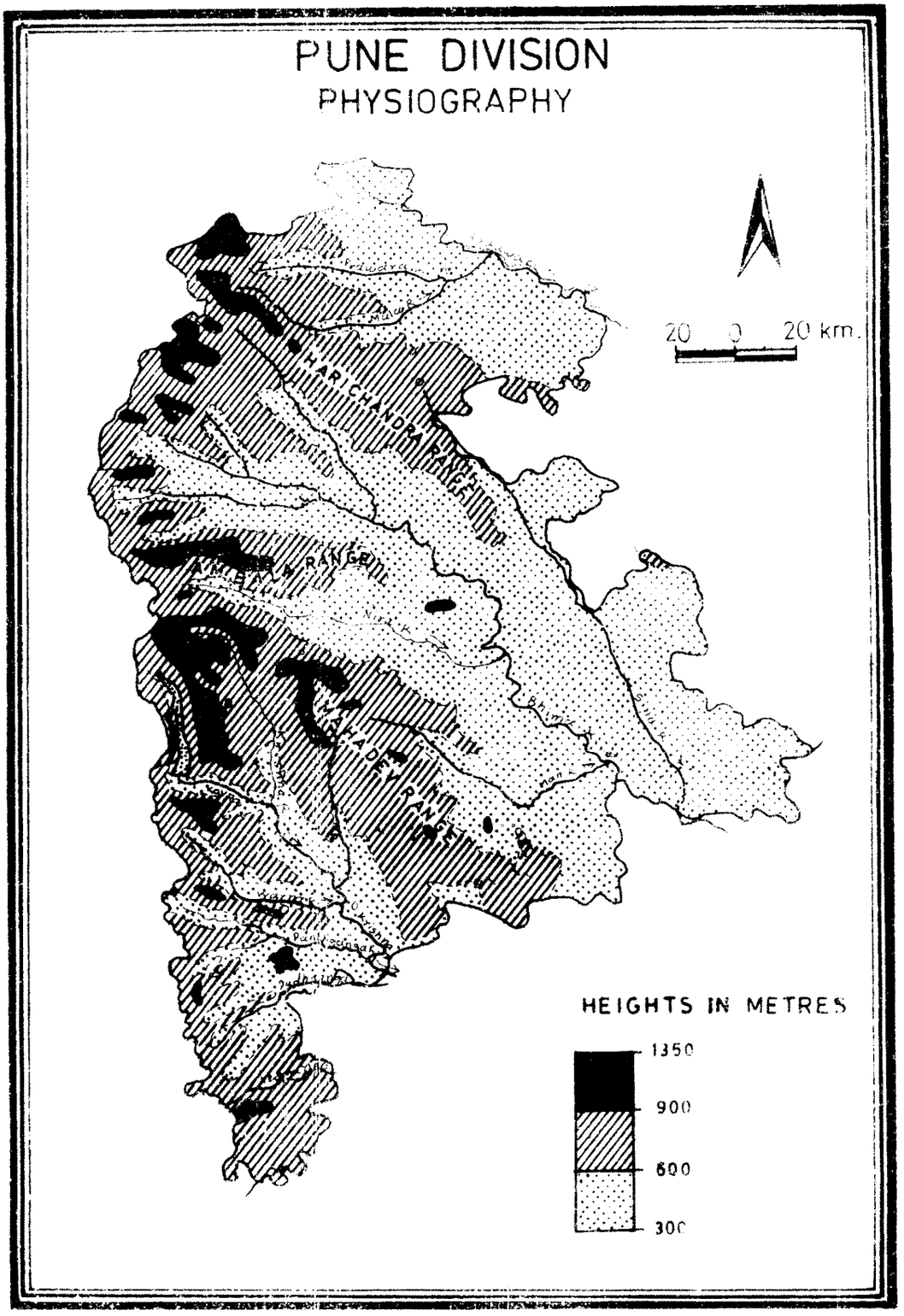

PUNE DIVISION
PHYSIOGRAPHY
20 0 20 km.
HARICHANDRA RANGE
MAHADEV RANGE
HEIGHTS IN METRES
1350
900
600
300

Fig. 2·1

towards southern side of the Pune division. Harichandra and Balaghat hills have passed through Ahmednagar, some part of the Solapur and Pune districts.

Krishna river has emerged from Sahyadri range area. This river flows eastward with its main tributory Koyana and flows towards eastward at a height of 300 to 400 meters above mean sea level. Bhima river valley is located at a height of 300 to 500 meters above mean sea level. The river Panchganga originates in the hilly areas of Sahyadri, runs towards eastern side and joins the Krishna at Narshihwadi, Krishna river valley is located in the southern part of the division.

2.2.2 Drainage :

Rivers in the Pune division generally run eastward. Krishna is most important river in the Pune division. Krishna river emerges from the Mahabaleshwar hill, and flows eastward, Koyana is a tributory of Krishna river which drains some part of Satara district. Panchganga river is a tributory of Krishna river joins the Krishna at Narshihwadi, which drains some part of the Kolhapur district, Bhima river is another most important river in the Pune division, Bhima river emerges from the southern slope of Bhima Shankar hills, and drains some part of Pune district and whole Solapur district.

Tanks are found in Satara district, which are used for electricity as well as for irrigation purposes. There are two main river basins in Pune division namely Krishna and Bhima

used mainly for irrigation purposes. The Panchganga, Warana, Koyana, Mula and Sina the other notable rivers form important basins in Pune division for irrigation purposes.

Physiography and drainage are responsible for distribution of major diseases in any region. The researcher could not give the information about relationship between physiography, drainage and distribution of diseases, for the region as a whole at micro level. However the general pattern of distribution of major diseases shows that the death rates are low on the mountaneous area especially in the eastern part of Sahyadri region and Mahadev and on the western part of Harichandra-Balaghat hills of Ahmednagar, Pune, Satara, Kolhapur and Sangli districts and central part of Satara and Pune district. In the river valleys namely Krishna, Bhima, Panchganga, Koyana, Mula and Warana, the death rate is comparatively higher. Amongst these river valleys of the region, Krishna and Panchganga basins of Sangli, Satara and Kolhapur districts are mainly responsible for the spread of waterborne diseases like dysentery, cholera and diarrhoea, where the water of the rivers get contaminated due to human activities. It may be stated generally that drainage plays a vital role in distribution of infectious waterborne diseases in a region. Man made pollution of the river water is seriously affecting the health of man.

PUNE DIVISION

DYSENTERY & DIARRHOEA

RELATION BETWEEN MONTHLY RAINFALL, TEMPERATURE & No. OF DEATHS

DISTRICTS

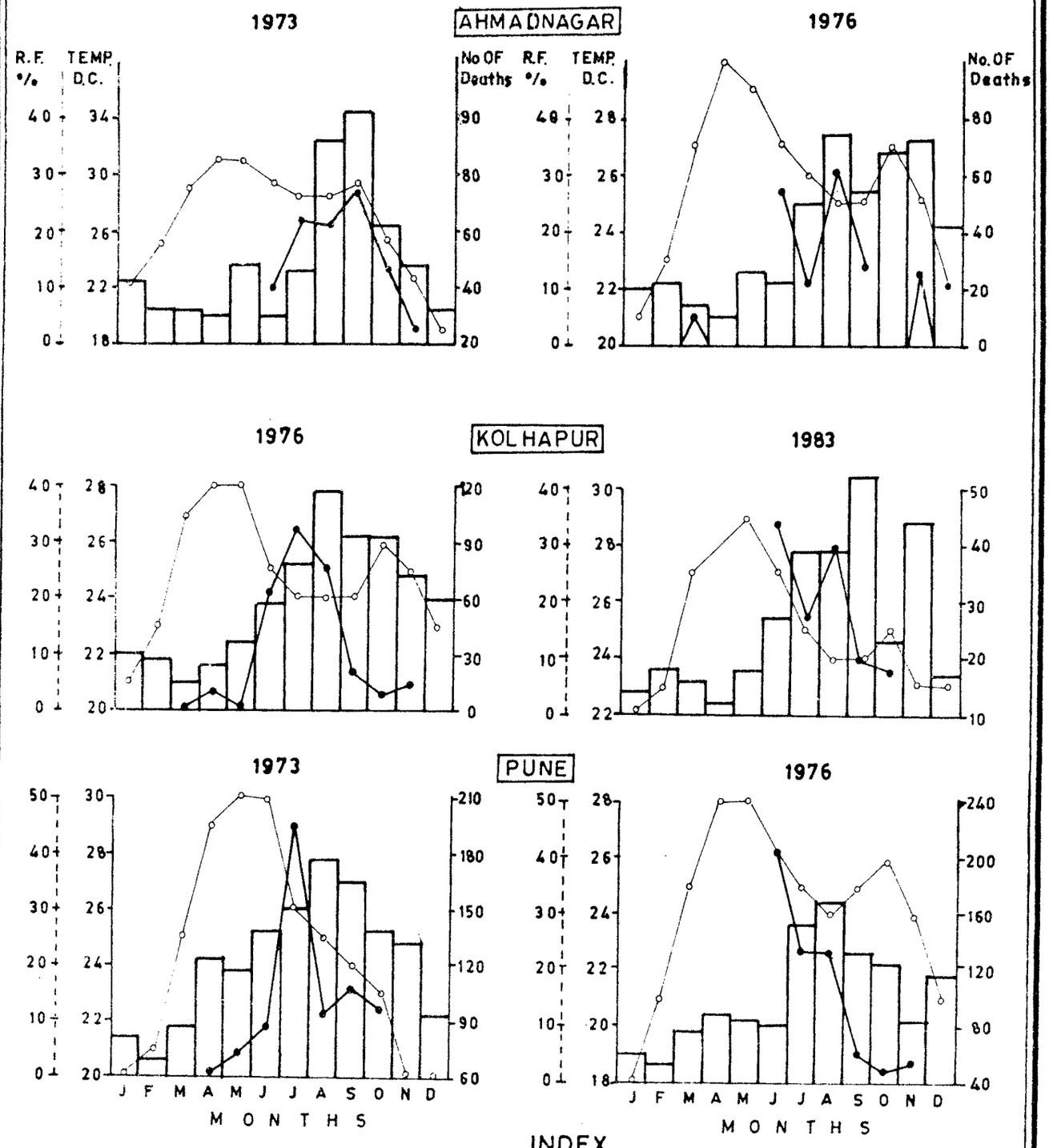


Fig. 2·2

PUNE DIVISION

DYSENTERY & DIARRHOEA

RELATION BETWEEN MONTHLY RAINFALL, TEMPERATURE & No. OF DEATHS

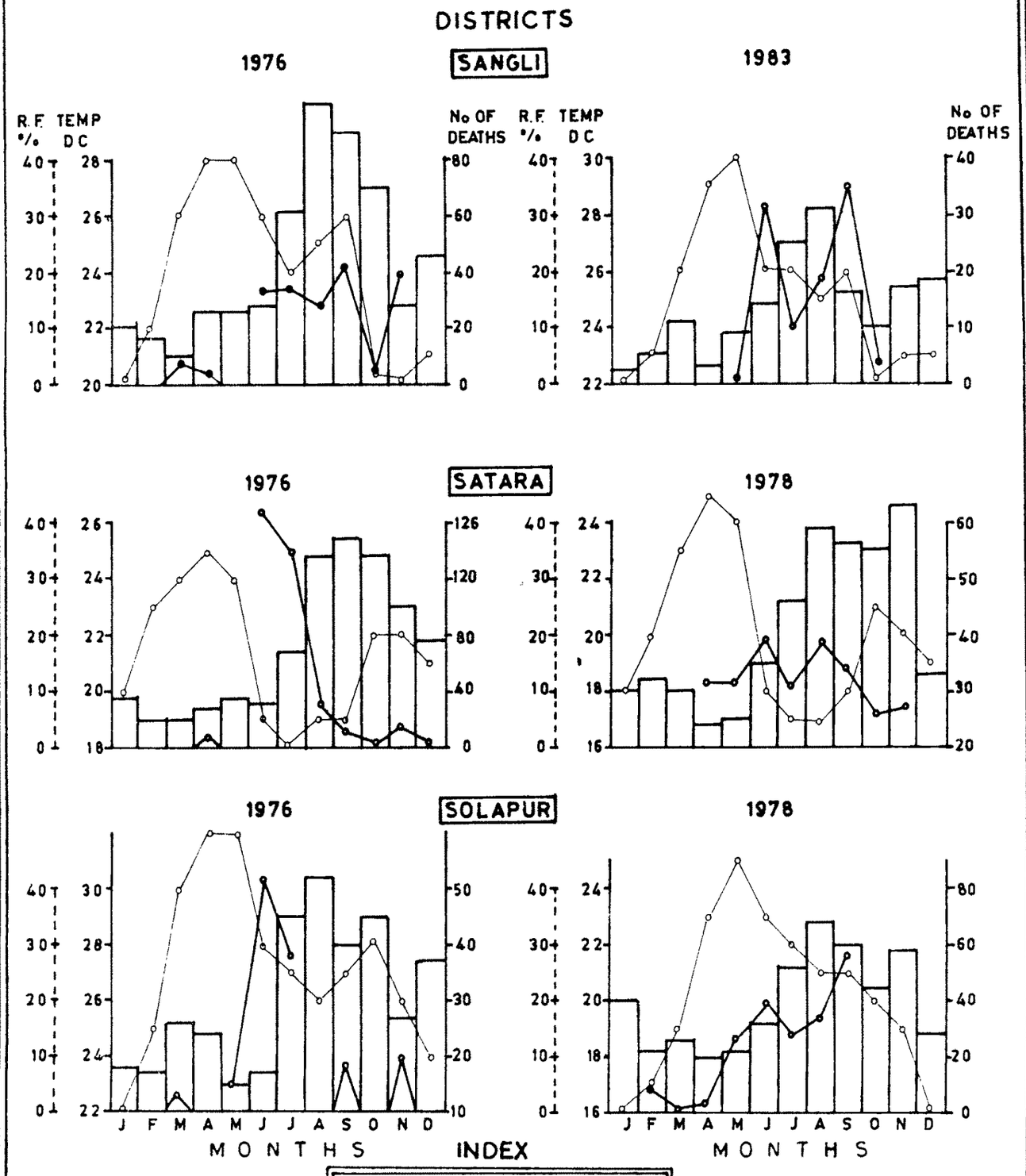


Fig. 2·3

2.2.3 Climate :

Generally the health of man is greatly affected by climatic conditions. There is a positive relationship between climatic conditions and health. The seasonal variations in climatic conditions give rise to the spread of various types of diseases in any region. The main elements of climate like temperature, rainfall, pressure, humidity and some others modify the health characteristics of man.

Generally high temperature and high humidity content are responsible for the rapid growth of the diseases. Rainfall plays an important role in causing certain infectious diseases. In this region, temperature varies in the different parts in the eastern part of Sangli, Solapur and southern part of Ahmednagar districts the temperature is generally high. Due to climatic variations the death rate also varies from place to place. Most of the rainfall is caused by the summer monsoon. Rainfall modifies the health of man. The maximum cases of illness due to dysentery, diarrhoea and cholera occur during rainy season.

Temperature varies in the various parts of Pune division. It is very high in Solapur, Pune, Ahmednagar and become low in Satara, Sangli and Kolhapur. Due to climatic variations in the region, death rate also varies from place to place. Fig.2.2 and 2.3 shows the relation

VITAL STATISTICAL RATES OF PUNE DIVISION

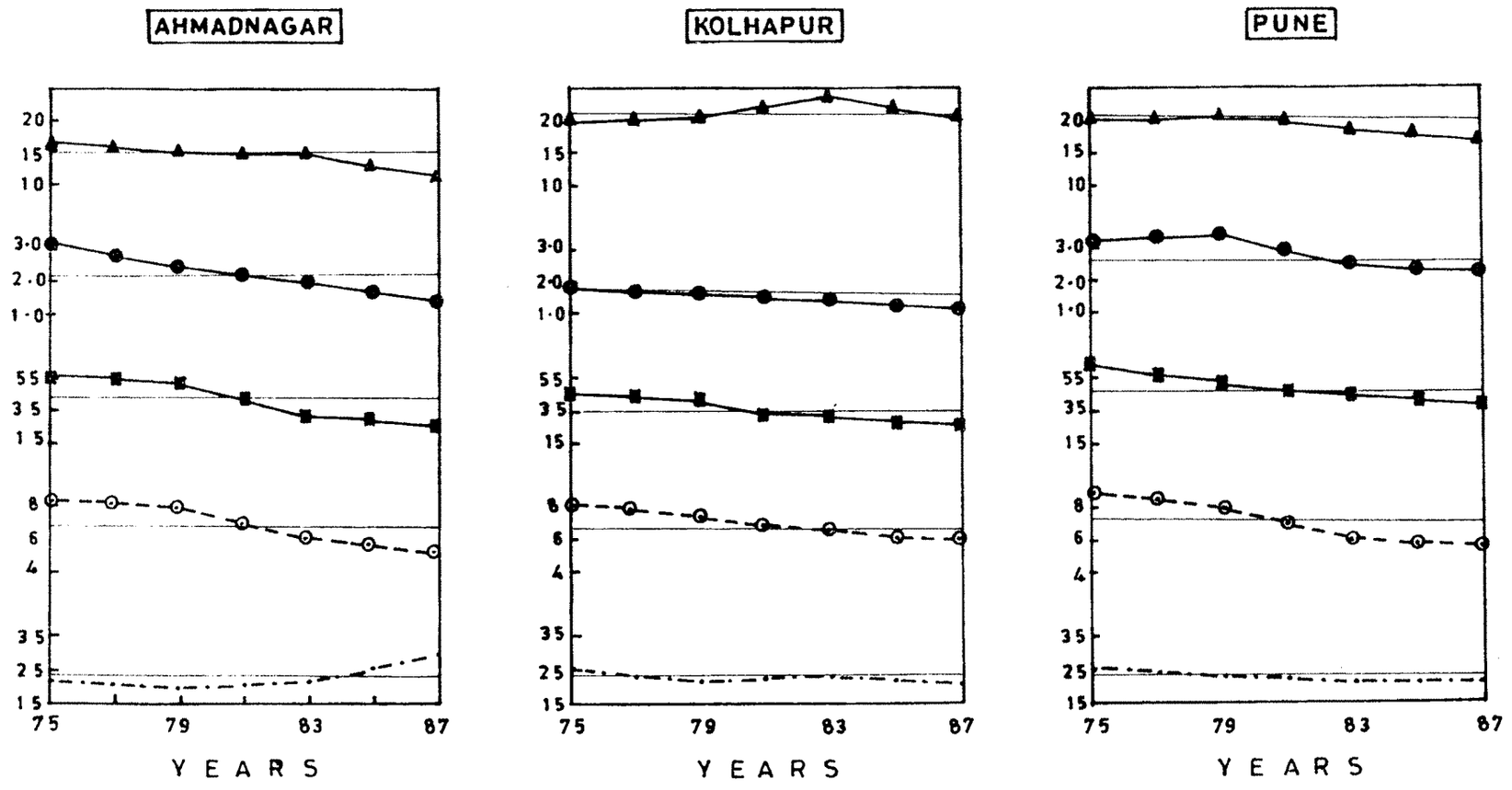


Fig. 2·4

between monthly temperature, percentage of monthly rainfall and the monthly death rate of major waterborne diseases namely dysentery and diarrhoea. It is observed that these waterborne disease are mainly spreaded during rainy season when the temperature is low i.e. 25°C and rainfall is more.

The southwest monsoon starts in the month of June and more than 85% of the annual rainfall occurs in four rainly months viz. June, July, August and September. The mortality rate of dysentery and diarrhoea starts increasing by the onset of monsoon and reaches to its peak in July and August and then in September the rate decreases. The graph shows the positive relationship between monthly death rate of desentery and diarrhoea and amount of rainfall. In the Pune division death rate of dysentery and diarrhoea diseases seems to be very high in the July, August and September. It is because of rainfall occurances.

2.3 VITAL STATISTICAL RATES :

The study of different statistical rates may be the correct approach to measure the health conditions of any region. The overall well-being of any region can be judged by studying different rates of health statistics. Hence the researcher has calculated the Birth Rate (B.R.), General Death Rate (D.R.), Infant Mortality Rate (I.M.R.), Maternal Mortality Rate (M.M.R.) and Still Birth Rate (S.B.R.) for

VITAL STATISTICAL RATES OF PUNE DIVISION

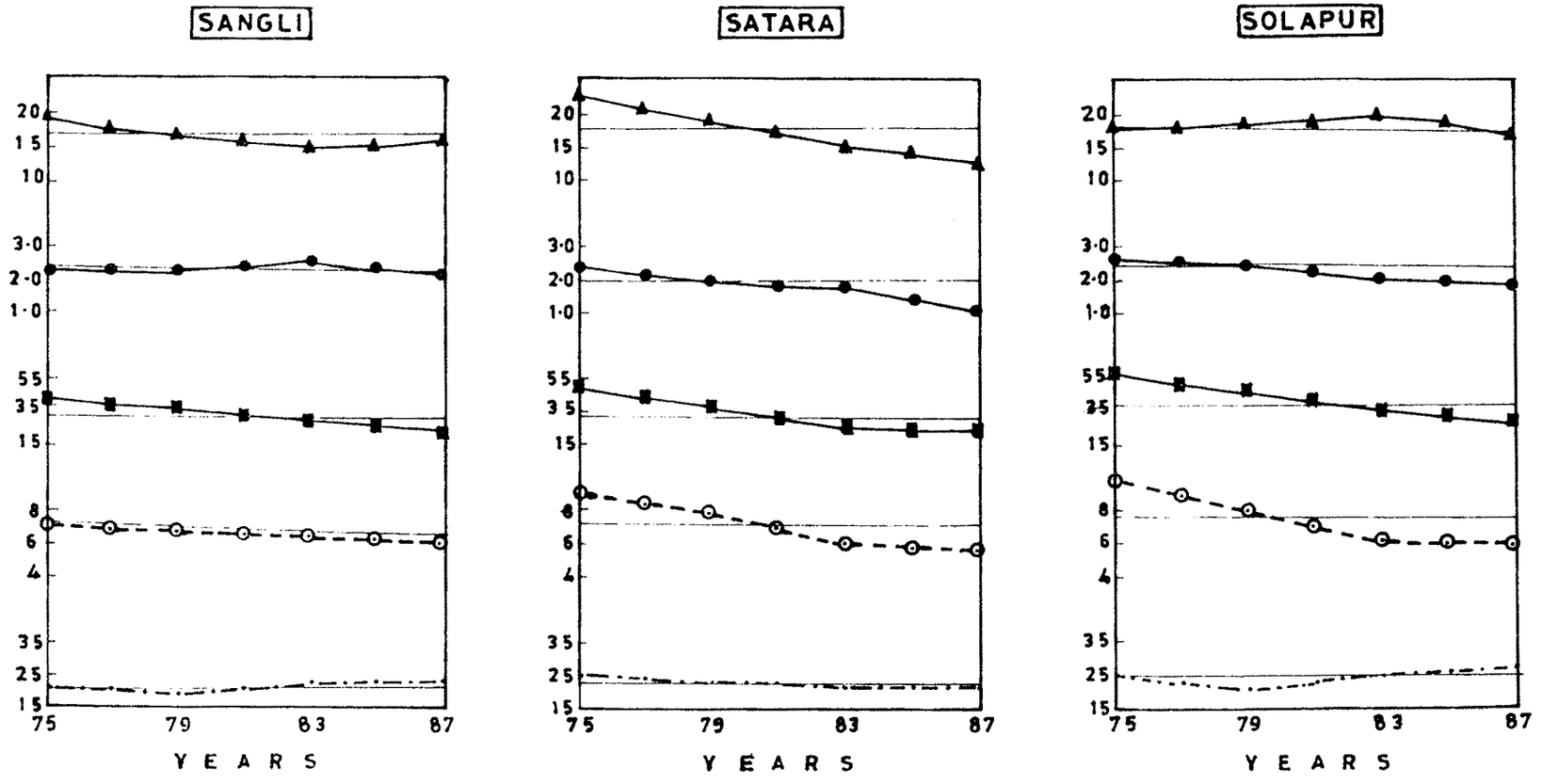


Fig.2·5

Pune division for a span of 16 (sixteen) years i.e. 1972 to 1987 and has been shown in Table 2.1 and Figs 2.4 and 2.5.

The general birth rate shows a slight decrease through out the span of 16 years as there are also variations in the pattern of decrease of birth rate. The districts like Pune and Satara reveal that birth rates do slightly decrease through out the span of 16 years. The districts like Sangli, Solapur and Kolhapur reveal that birth rate decreases gradually upto 1979 then it has increased from 1983 except Kolhapur district. In Ahmednagar district the birth rates have been increased from 1979 to 1987.

The general death rate also shows constant decrease in the whole Pune division. The general death rate has checked and shows gradual decrease upto the year 1983. The gradual decline in the death rate indicates the overall well being of the region regarding medical facilities.

The problems related to infant mortality are more severe in the Pune division. The infant mortality rates (I.M.R.) have been calculated per thousand live births which indicates that there is rapid decline in infant mortality in the districts of Solapur, Ahmednagar and Satara and gentle decline is noticed in the districts of Sangli, Pune and Kolhapur (Fig.2.4 and 2.5).

TABLE 2.1 : Vital statistical rates of Pune division (1972-87).

Year	Average	Birth Rate (B.R.)	Death Rate (D.R.)	Infant Mortality Rate (I.M.R.)	Maternal Mortality Rate (M.M.R.)	Still Birth Rate(S.B.R.)
1	2	3	4	5	6	7
1972	Division average	25.40	9.11	52.50	2.6	21.13
	State average	26.0	9.60	66.00	2.4	20.6
1973	Division average	22.69	9.35	57.83	2.5	19.58
	State average	24.1	10.20	69.00	2.3	21.30
1974	Division average	23.66	8.28	48.00	1.9	20.16
	State average	23.50	8.70	57.00	2.0	19.80
1975	Division average	22.80	8.16	49.50	2.1	19.51
	State average	24.00	8.70	58.00	2.1	20.30
1976	Division average	22.60	8.01	44.00	2.0	19.43
	State average	23.60	8.30	53.00	2.0	20.50
1977	Division average	19.81	8.13	45.16	1.9	18.51
	State average	21.40	9.10	57.00	1.9	20.10

Conti..

Table 2.1 conti..

1	2	3	4	5	6	7
1978	Division average	20.03	7.35	38.50	2.0	19.21
	State average	21.30	7.60	48.00	1.9	20.90
1979	Division average	20.83	7.76	44.16	2.3	19.43
	State average	22.20	8.30	53.00	2.1	20.70
1980	Division average	21.93	6.43	33.83	2.0	18.68
	State average	21.70	6.70	43.00	1.8	20.50
1981	Division average	21.68	6.03	33.83	1.8	18.16
	State average	21.30	6.50	42.00	1.6	19.50
1982	Division average	23.38	5.98	30.30	1.4	17.11
	State average	21.50	6.10	37.00	1.4	17.50

Conti..

Table 2.1 conti..

1	2	3	4	5	6	7
1983	Division average	22.13	6.26	31.33	1.7	17.66
	State average	20.70	6.50	40.00	1.7	19.30
1984	Division average	21.95	6.03	28.83	1.5	17.26
	State average	20.50	6.00	36.00	1.5	16.60
1985	Division average	22.50	5.96	30.66	1.5	16.90
	State average	20.70	6.20	40.00	1.6	15.90
1986	Division average	24.60	6.01	28.50	1.5	15.16
	State average	22.20	6.10	37.00	1.6	16.50
1987	Division average	26.25	5.63	24.83	1.2	14.45
	State average	22.60	5.90	33.00	1.3	15.4

SOURCE : Compiled by Author, based on Vital Statistics, Maharashtra State, Pune.

The causes of maternal mortality are many and they may be either biological, economical, social or cultural. Maternal mortality rates in the districts of Satara have declined upto 1983 and then they have again declined. In Pune district, the M.M.R. has increased upto 1979 and then it has decreased. In Sangli district the M.M.R. has slightly increased in between 1979 and 1983 and then it has declined. But in the districts of Ahmednagar, Kolhapur and Solapur, the M.M.R. was constantly declining from 1972 to 1987.

The still birth rate shows constant decrease in Pune division. In Kolhapur and Solapur districts S.B.R. shows the constant increased upto 1983 and then it has slightly decreased. In the districts of Satara, Ahmednagar and Pune, the S.B.R. has constantly decreased from 1972 to 1987. In Sangli district, S.B.R. shows the constant decline upto year 1983 and then it has slightly increased.

All the rates show the gradual decline in the span of 16 years period. The improvement in the medical facilities in this area especially by localizing the primary health centres for the benefits of rural population might be the answer to this constant decline in the different rates.

The general birth rate shows a slight decrease through the span of 16 years as there are less variations in the pattern

of disease in the birth rate. Table 2.1 shows divisional averages and state average of various statistical rates in the Pune division. The general birth rate of Pune division has increased from 25.4 in 1972 to 26.25 in 1987. But birth rate of state has decreased as compared to Pune divisional average (in 1972, 26.0 and in 1987, 22.6). The birth rate of Pune divisional decreased from 25.4 in 1972 to 20.8 in 1979, as compared to the state average (in 1972, 26.0 and in 1979, 22.2). After 1980, the divisional birth rate average was higher than the state average. In 1972, the birth rate of Pune division was lower than the state average but in 1983 birth rate has gone up than state average, and after 1983, it has still gone more higher. The number of births taken in Pune division are more than the state averages. It shows that the efforts made by state government in this area to decrease the birth rate has failed. The family planning programmes must be seriously and effectively launched in these six districts. In Ahmednagar and Solapur districts, the family planning programmes must be seriously launched as the rates show constant increase (Fig.2.4 and 2.5).

The general death rates shows constant decrease in the division. The death rate has checked as it was above 7.0 before 1979 but has decreased upto 5.63 in all districts by 1987. Generally the death rate was comparatively low in Pune division than in state. The gradual decline in the

death rate indicates the overall well being of the region especially regarding availability of medical facilities. However the Sangli district, decline in death rate is not so sharp.

The problems related to infant mortality are more severe and serious in the Pune division. The infant mortality rates (I.M.R.) have been calculated per thousand (1000) live births which indicates that there is rapid decline in infant mortality in the Pune division. It has decreased from 52.5 per 1000 live births in 1972 to 24.83 per thousand live birth in 1987. It means the rates have reduced to more than half in 16 years duration and the rate of decline is almost constant every year. As compared to other five districts the (I.M.R.) of Pune district are more and even the declining rate is not so sharp. In future more attention be paid in improving the infants' health of Pune district.

Maternal mortality itself becomes the major cause of infant mortality in the underdeveloped countries like India. There are several causes of maternal mortality namely biological, economical, social or cultural. The health, altitude inability and understanding of the mother are directly concerned with the welfare of the baby and the mother also.

The M.M.R. in Pune region has shown declining trend from 2.6 in 1972 to 1.2 in 1987. These divisional maternal mortality rates are higher than the rates of the state.

The deaths of mother during the time of delivery are more in Pune division than the Maharashtra as whole. Amongst the six districts of the region, the Solapur shows highest M.M.R.. The average M.M.R. of Solapur district is higher than the other five districts.

The still birth rate of Pune region shows decreased from 21.13 in 1972 to 14.45 in 1987. It is observed that the still birth rates of state are lower upto 1974 except 1973, then the still birth rates of state are higher than the divisional averages except 1984 and 1985. The average S.B.R. of the Kolhapur district is highest among the region which is 21.00 per thousand live birth which is also higher than the state averages.

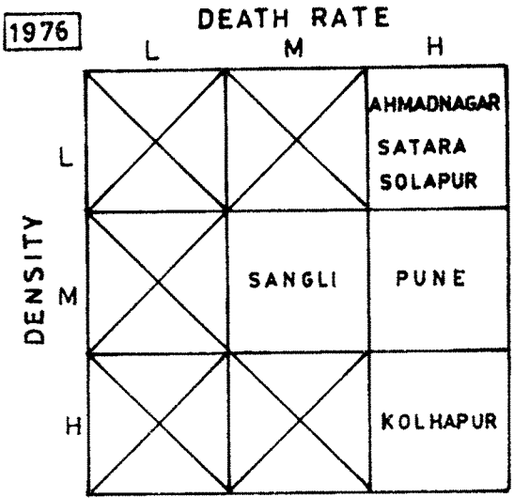
In general except B.R. the other rates show constant decline and are either at par or lower than the state averages. As compared to other divisions of Maharashtra, the Pune division enjoys more medical facilities. The localization PHC's in the mofissil areas and increasing their number during plan periods have checked the D.R., I.M.R., M.M.R. and S.B.R. in this region. Attention be paid seriously to check the increasing births in these districts.

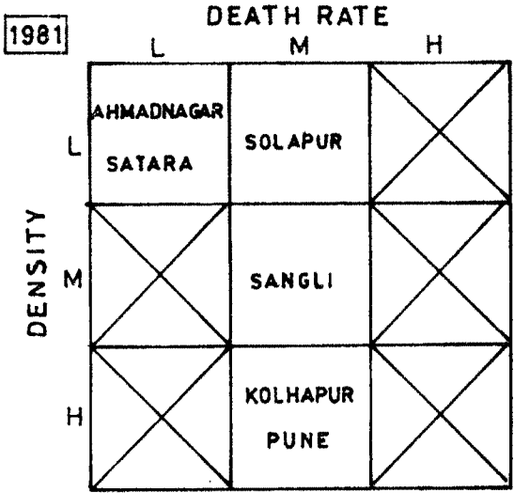
2.4 SOCIO-CULTURAL ENVIRONMENT AND HEALTH :

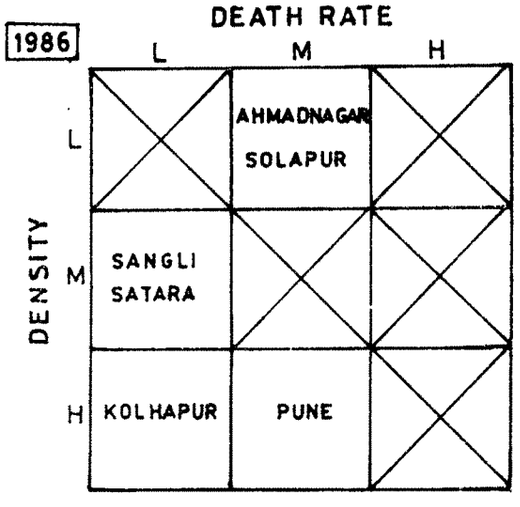
Socio-cultural factors and health are closely related to each other. Socio-cultural environment influences the health

PUNE DIVISION

RELATION BETWEEN DENSITY AND DEATH RATE







INDEX

DENSITY OF POPULATION
PERSONS PER Sq. KMS.

L – 150 To 200

M – 201 To 250

H – 251 And ABOVE

DEATH RATE PER 1000 POPU

L – BELOW 6·0

M – 6·1 To 7·0

H – 7·1 And ABOVE

L – LOW

M – MEDIUM

H – HIGH

Fig. 2·6

of man. Many times the activities of man are controlled by the socio-cultural environment, socio-cultural factors are variable in nature and they occur in varied combination in different areas and at different times.

The socio-cultural factors are not as rigid as that of physical factors and hence they can be altered or modified with systematic efforts of man for his well being. A study of effect of socio-cultural environment on the health has become important in the underdeveloped countries like India where majority of population is residing in rural areas.

In this research work the researcher has proposed to examine some important socio-cultural factors in the context of health and diseases in Pune division. These parameters are density of population, age and sex structure, literacy and some others.

2.4.1 Density of population :

The density of population, a major socio-cultural parameter affects the distribution of diseases in any area. This factor is more responsible for the spread of diseases. Many communicable diseases spread easily in densely populated areas. The proximity or nearness of contacts among the people is found mainly in crowded parts of the region. Skin to skin contacts are more where population density is higher. The general pattern of distribution of communicable diseases shows

that the death rates are low in sparsely populated areas, while the moderate rate of mortality may be observed in the medium density areas and the densely populated areas (viz. cities) show higher incidences of infectious diseases.

The districtwise relationship between death rate and density has been discussed and is shown in Fig.2.6 . Generally it is the accepted presumption that density of population and death rates are directly proportional to each other. This may be proved easily where the rate of spread of communicable disease is more. The aforesaid presumption does not prove to be correct in the case of Pune division. In the ten year period from 1976 to 1986, the Kolhapur district's death rate has gone down but the density remained high and has not changed. In Solapur, the density is low but death rate is medium to high. Inspite of constant density rates, the death rate has decreased in Satara district in the span of 10 years period. The Ahmednagar's slab of density has remained same but inspite of this, the death rate has decreased from high towards low. In short, the general preposition has not proved here. This might be because the percentage of deaths by communicable diseases might be very low in total number of deaths by all causes.

2.4.2 Age and Sex :

It is rather difficult to find out the relationship between incidence of particular disease and the age factor. Still the study of age pyramids may give a general findings of mortality pattern in any area. Certain diseases are more frequent in occurance in certain age groups than other. Generally, it is stated that the deaths below the age of 4 years and above 60 years are more in any area. The adolecent population which is directly exposed to the environment also shows more number of deaths (Pandurkar R.G.,1981).

The sex ratio has some relationship with the general health of the people. It is rather difficult to relate the incidence of particular disease and sex. Generally the women are better equipped than the males to get over the diseases. Women are less exposed to the environmental hazards than male. " In that sense, it is not women but man who is in the weaker vessel," (Mishra,1970).

The Fig.2.7-A deals with age and sexwise percentage of deaths in Pune division in a span of 16 years, while Fig.2.8 A and 2.9-A deal with districtwise age and sex pyramids. In the Fig.2.7-A, it is observed that the deaths above 60 years of age are more in both male and female in 1972 and 1985. The percentage of deaths in this age group has increased in both sexes in the span of 14 years. Fig.2.7-A deals with age and sex groupwise percentage of deaths occuring in Pune

PUNE DIVISION

MALE-FEMALE & RURAL-URBAN DEATHS OF TOTAL POPULATION

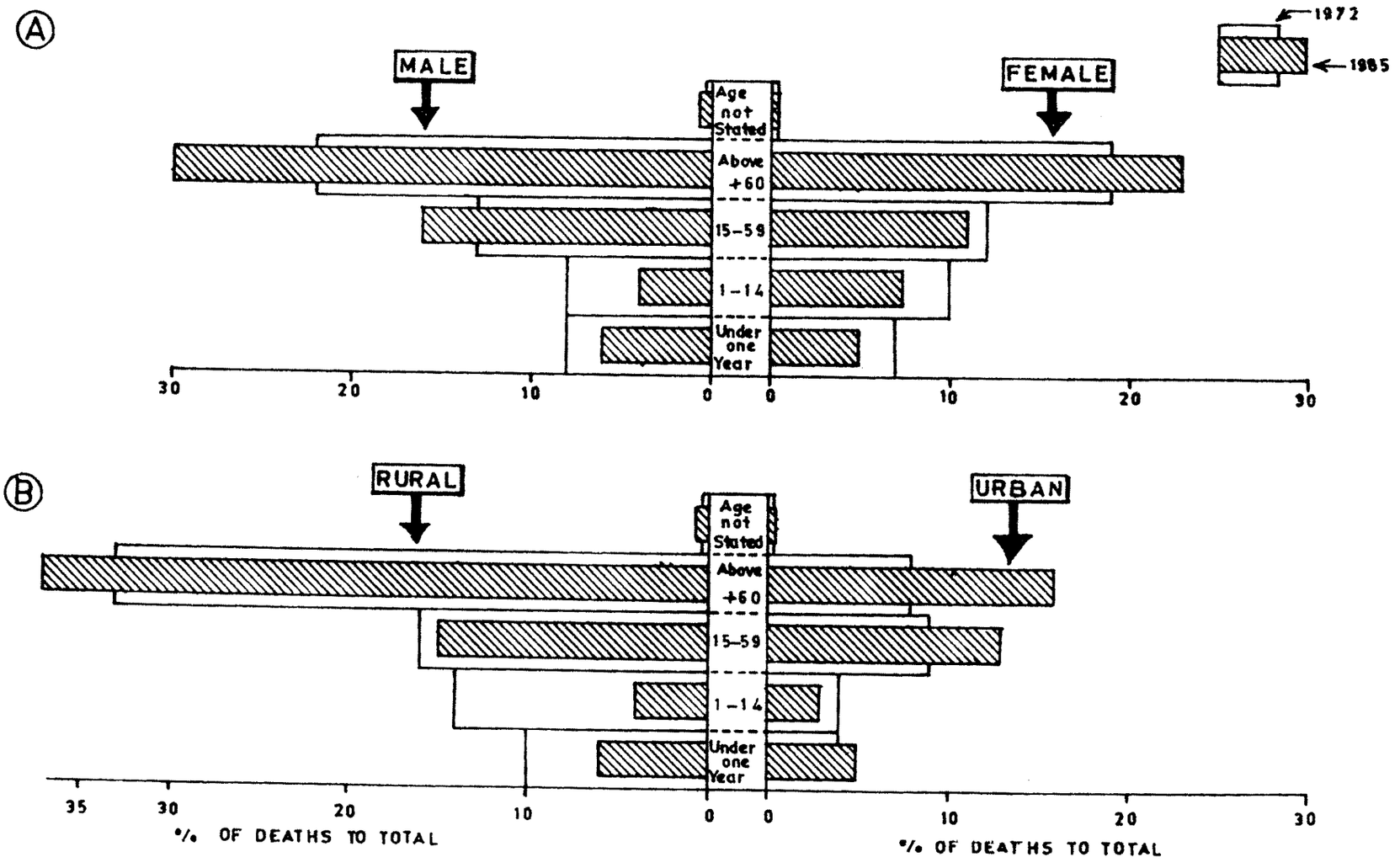


Fig. 2·7

division in a span of 14 years. The graph shows that more than 42 percent of the total deaths both of male and female have occurred at the age of 60 and above during 1972. This percentage has increased upto 53.40 in both sexes in 1985. It means during 14 years, the deaths of male and female above sixty (60) years age group have been increased by 27 percent. In 1985, the percentage of infants deaths (below one year) has decreased upto 4.1. There is also a decrease in the percentage of deaths in the young population who are in between 1 to 14 years of age. The percentage of deaths between 15 to 59 years (the working population) has also decreased in female, but increased amongst male. This indicates that in Pune division, the old and working male population is more sufferer than infants and children. The working population above 60 years of age in both sexes is at the increasing stage of victimisation by diseases and hence the clinics for aged population should be increased and be established in more number in this division.

Fig.2.8-A and 2.9-A deals with districtwise percentage of deaths in male and female of Pune division as per different age groups. All the six graphs of six districts shows the uniform pattern. The percentage of deaths amongst male and female above 60 years of age and percentage of deaths among male population of working age group (i.e. 15 to 59 years) have increased in the 14 years' period. In rest of the age group, it is reverse. It means the percentage of deaths have

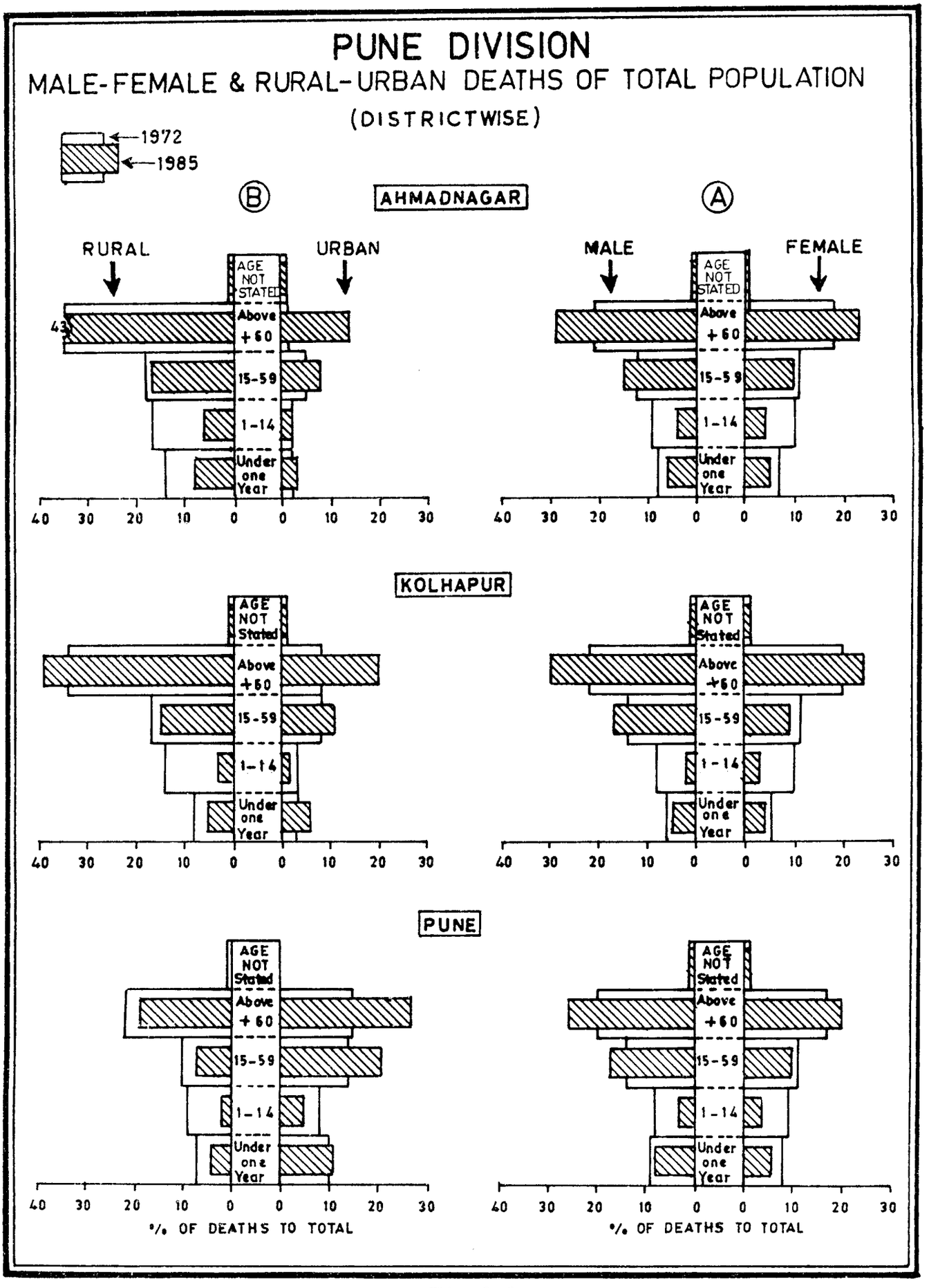

PUNE DIVISION
MALE-FEMALE & RURAL-URBAN DEATHS OF TOTAL POPULATION
(DISTRICTWISE)
1972
1985
B
AHMADNAGAR
A
RURAL
URBAN
MALE
FEMALE
AGE NOT STATED
Above +60
15-59
1-14
Under one Year
43
40 30 20 10 0 0 10 20 30
KOLHAPUR
PUNE
% OF DEATHS TO TOTAL

Fig. 2·8

decreased. Secondly in all age groups male deaths are more than its counterpart. With increasing age groups, the percentage of female deaths are increasing. Special attention is to be provided in taking the care of female in the reproductive age group (15 to 44 yrs) and in the later part of working age group (from 45 to 59 yrs). There are no much variations in the individual districts pattern.

The aged population of both sexes and working male population is to be provided with well equipped medical facilities.

The age pyramids are drawn on the basis of total mortality rates and hence diseases of female are not studied separately and hence age pattern will show generalised conclusions.

2.4.3 Rural and Urban differences :

The age groupwise deaths occuring in rural and urban areas can be a good study to draw the conclusion for studying the rural and urban medico-geographical pattern.

Fig.2.7-B deals with age groupwise percentage of deaths in both rural and urban areas of Pune division. It is stated that the deaths below one year are more in urban areas than in rural areas in 1985. In the age group of 1 to14,

PUNE DIVISION

MALE-FEMALE & RURAL-URBAN DEATHS OF TOTAL POPULATION

(DISTRICTWISE)

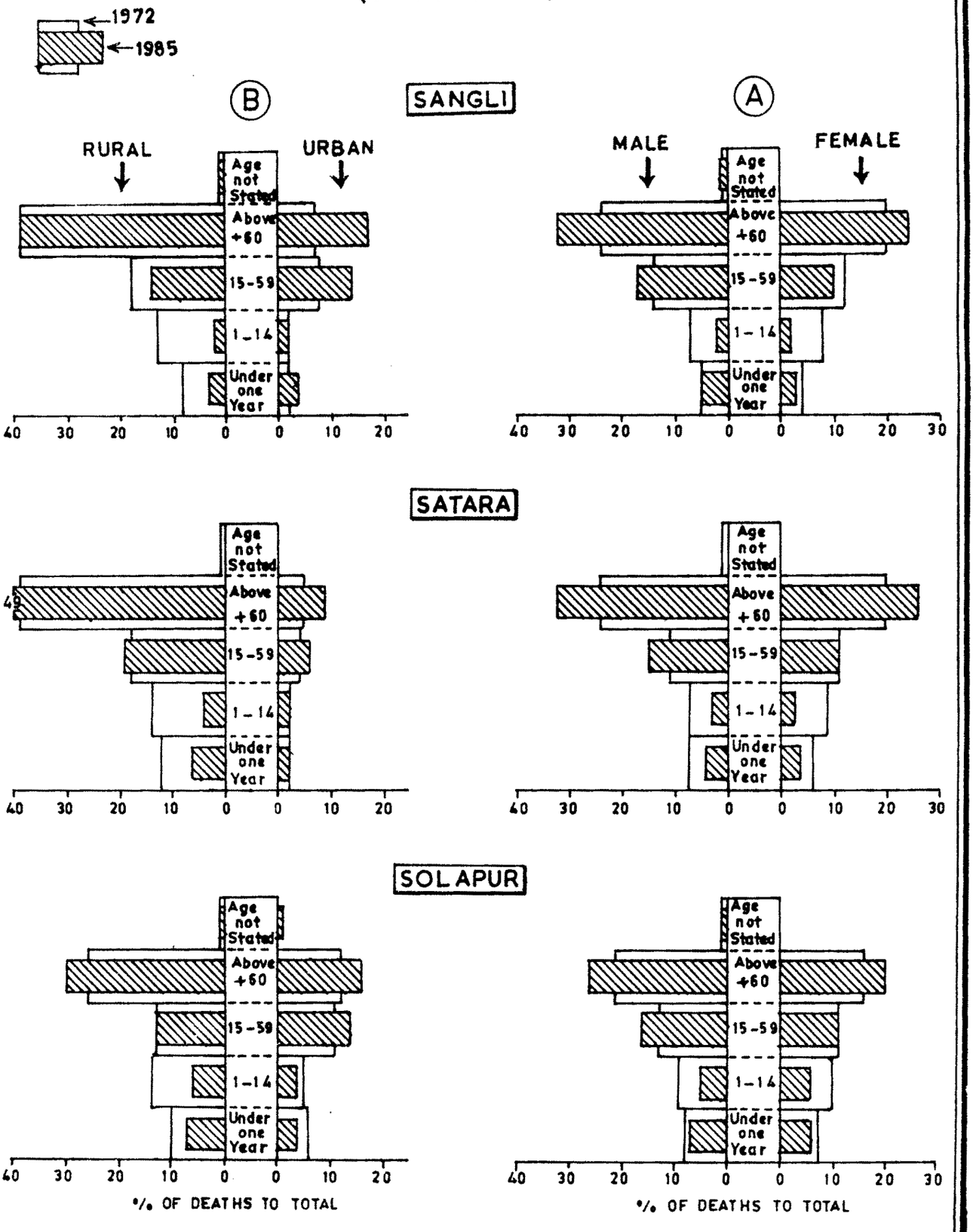


Fig. 2·9

the percentage of deaths have rapidly decreased in rural areas from 1972 to 1985. The percentage of deaths between 15 to 59 years has increased in urban area from 1972 to 1985, but shows decrease in the rural area. The deaths above 60 years of age are more in both urban and rural area. This shows that rural urban deaths in Pune division above 60 years of age are more than any other age groups. It is generally stated that with increasing age, the risk of death increases. The percentage of rural death are more than the urban deaths. It is true that vast rural population remain devoid of medical facilities. To control this high percentage of deaths in villages, the medical services need to be spreaded in more quantity in cities.

Fig.2.8-B and 2.9-B deal with districtwise percentage of deaths in both rural and urban areas. Generally this graph shows that in all districts, the percentage of deaths between 15 to 59 years and above 60 years of age are more in 1985 than in 1972. In Ahmednagar and Satara districts, percentage of deaths are more in rural areas than urban area in the age group of sixty and above. In Kolhapur, Pune and Sangli districts, percentage of deaths are more in urban areas than rural areas. The percentage of infants deaths are more in urban areas of Ahmednagar, Kolhapur, Pune and Sangli districts during 1985. This indicates that in districts of Pune division, the rural working population is in the weaker cell of health. Rural areas are more victimised than their counterpart.

2.5 DISEASE INTENSITY AND RANKING :

2.5.1 Introduction and Methodology :

The study of disease intensity and ranking may be very useful in understanding the disease distribution in any area. This study may provide an idea of relative dominance of different diseases in order of importance.

The ranking techniques are based on percentage of deaths of ten (10) major diseases in the particular year. Cause specific death rates of various diseases have been calculated for the sixteen (16) years per 100,000 population. Districtwise average death rates have been calculated for each year while considering percentage of deaths by each diseases, ranks have been given for those particular diseases from 1st rank to 10th rank.

Fig.3.11 shows that tuberculosis and diarrhoea are always of first and second rank in almost all districts of Pune division while cancer and tetanus rank 3rd or 4th in position but sometimes tetanus is shifted to 5th rank. Pneumonia and measle are the diseases of 5th and 6th rank respectively. Dysentery, malaria and cholera generally occupy the 7th, 8th and 9th rank respectively.

This ranking technique shows that tuberculosis, diarrhoea, cancer and tetanus are the diseases which have

highly emerged out in this Pune division. Tuberculosis, diarrhoea and cancer are also the serious diseases in Pune division.

2.5.2 Districtwise ranking of diseases :

The ranking techniques used here is based on mortality rates calculated for particular disease in particular year and for particular district. For example (Fig.3.11) in 1972 in Sangli district, the number of deaths due to tuberculosis disease were highest amongst all, hence this disease has given the first rank in 1972. The number of deaths by dysentery during the same year were lowest amongst all, hence the disease dysentery have been alloted the last rank i.e. 10th. Accordingly, for each disease yearwise rank have been calculated and is shown in Fig.3.11.

The districtwise techniques shown here depicts that tuberculosis, diarrhoea, cancer and tetanus are the dominant diseases of the Pune division. Amongst them, tuberculosis disease is of serious nature which remained first in their rank in the districts of Ahmednagar, Sangli, Kolhapur and Solapur and remained of second rank in the districts of Satara in its rank of 16 years period. Diarrhoea also show its remarkable influence in this region particularly in Kolhapur and Satara districts. It remained first in its rank and second in Ahmednagar, Sangli and Solapur districts.

The cancer whose deaths are also remarkable as the disease stands third in it's rank in this division. The prevalence of cancer is also to be taken into consideration as the disease has grouped in the higher ranking order. The eradication of cholera and malaria has been noted in this division since 1975.

As per the data of 1972 to 1987, ranking order shows the following three groups of diseases with varying intensity.

(A) Diseases of higher ranking order
(roughly from I to III rank)
- i) Tuberculosis
- ii) Diarrhoea
- iii) Cancer

(B) Diseases of moderate ranking order
(roughly from IV to VII rank)
- iv) Tetanus
- v) Pneumonia
- vi) Leprosy
- vii) Measle

(C) Diseases of low ranking
(roughly from VIII to X rank)
- viii) Dysentery
- ix) Malaria
- x) Cholera

2.5.3 Citywise ranking of diseases :

The researcher has selected 17 cities from Pune division for which cause specific death rates per 100,000 population were calculated (Fig.4.18 to 4.20). The data were available for 12 cities from 1972 onwards upto 1987, and for five cities from 1982 to 1987. Due to highest cause specific death rate, the disease occupies the highest rank, e.g. in Miraj city in 1972, the tetanus death rate was highest amongst other diseases prevalent in Miraj and hence tetanus occupies the Ist rank. The death rate of leprosy of Miraj city in 1972 was the lowest, hence the disease occupies the VIth rank. Accordingly, for all the cities, the rank orders have been calculated and are shown in Figures 4.18 to 4.20.

This ranking technique shows that some diseases are severely affecting in the cities which occupy highest ranks. Tuberculosis is a disease which is heavily spreaded and occupies Ist rank in the cities like Ahmednagar, Barsi, Kolhapur, Sangli, Solapur, Baramati and Kopargaon cities. Death rate due to diarrhoea is highest and occupies the Ist rank in Shrirampur, Karad and Ichalkaranji city and IInd rank in Kolhapur, Satara and Baramati city. In almost all cities, the tuberculosis, diarrhoea, cancer, pneumonia and tetanus are the major diseases which are responsible for increasing higher order mortality. In Pandharpur and Pune

cities pneumonia disease occupies first rank in 1972. Deaths due to cancer are more in the cities like Islampur, Phaltan and Sangamner. Deaths due to T.B. are increasing day by day in major cities in Pune division. The detailed study of these diseases at district and city level is made in Chapter No. III and IV.

2.6 CONCLUSION :

While studying the physical and social environment and it's effect on distribution of diseases in Pune division, it is found that the low death rate is remarkably found in Sangli, Kolhapur, Ahmednagar and Satara districts which are the hilly areas. While in the river plain area the death rate is high. The waterborne diseases show their higher prevalences in the river basins like Krishna-Koyana, Bhima-Sina and Panchganga and Bhogawati. It is found out that climate plays a major role in the distribution of diseases seasonwise. The number of deaths starts increasing at the onset of monsoon when the occurance and spread of waterborne diseases is more. The number of deaths are more in rainy season than in non-rainy season.

While studying the impact of socio-cultural factors it is noted that number of deaths in the working age group and that of old age above 60 years are rapidly increasing, while the infants and young population is much more safer.

It is interesting to note that 1 to 14 years age group in the Pune division is the most safest age group.

The districtwise and citywise cause specific death rates and the ranking techniques show that tuberculosis, diarrhoea, cancer and tetanus are the major diseases of the Pune division. On the other hand, the malaria and cholera has been on the path of their gradication from the Pune division.

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