CHAPTER - II

ENVIRONMENT AND ITS EFFECT ON DISTRIBUTION OF DISEASES

2.1 INTRODUCTION :

It is well known fact that man is controlled by the nature in which he resides. It is true that environment affects the health of the individual and of society. " In the modern concept, disease is nothing but a disturbance in the delicate balance 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 disease, prevent or control it," (Park and Park,1979).

There are several factors included in the physical physico-environment namely physio-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 influences the man's health as well as the community's health.

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 seven (7) districts in Marathwada 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 districtwise distribution of diseases.

2.2 PHYSICAL ENVIRONMENT :

As stated earlier, environment may be divided into two types i) Physical and ii) Socio-cultural. Physical environment consist of non-living things and certain physical factors viz. physiography, drainage, soil, climate etc. Man is in constant interaction with this physical environment. The effect of physical environment on the health of man can be studied with physiography, drainage and climate as they are the dominant factors.

2.2.1 Physiography :

The whole region of Marathwada lies in the Upper Godawari basin (Fig.2.1). The region consists the part of the Deccan plateau dissected by different ranges. The Satmala and Ajanta ranges enters in the upper most part of the division. The Osmanabad and Jalna hill ranges which branches from the Satmala range runs through Aurangabad district. The Balaghat hill range traverses through Beed district. The Balaghat and Ajanta range have average height 900 metres above sea level. The whole Osmanabad district is situated on a plateau having height 800 metres above mean sea level. The central part of Marathwada region is low lying area made of Godawari river

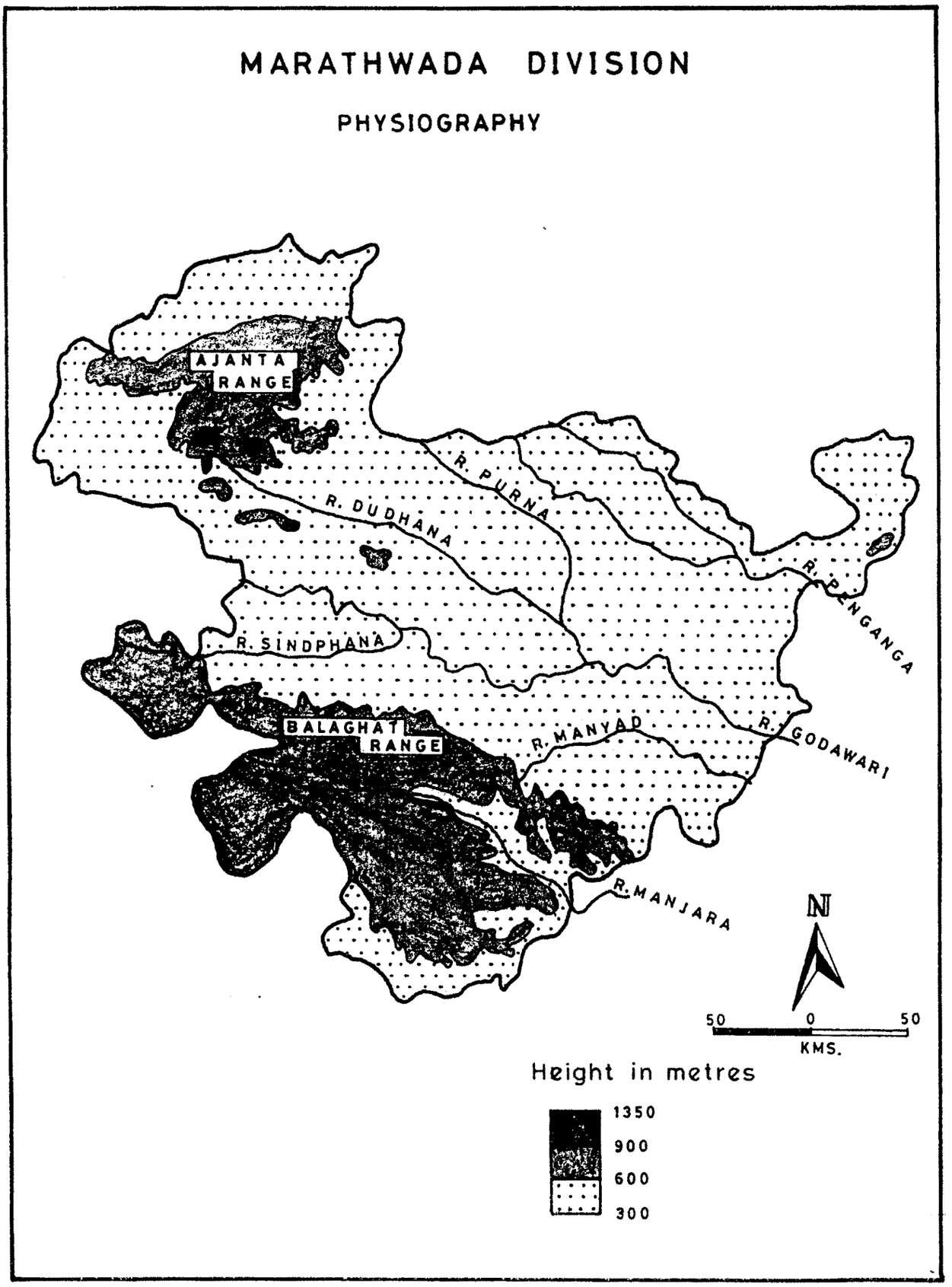

MARATHWADA DIVISION
PHYSIOGRAPHY
AJANTA RANGE
BALAGHAT RANGE
R. PURNA
R. DUDHANA
R. SINDPHANA
R. PENGANGA
R. MANYAD
R. GODAWARI
R. MANJARA
N
50 0 50
KMS.
Height in metres
1350
900
600
300

Fig. 2·1

plain which is having a height ranging between 300 metres to 600 metres above mean sea level. The Ajanta and Balaghat ranges are separated by the Godawari river basin. The other important hill projections noted in the division are Daultabad, Chowka, Josna, Kandhar, Jintur and Parner.

In sum, physiographically the region can be divided into 3 main units -

(i) The hilly area comprises of some part of Ajanta and Balaghat range

(ii) Plateau region - Major part of the division is a part of basaltic Deccan plateau and

(iii) The low land area made up by Godawari, Dudhana and Purna river basins.

2.2.2 Drainage :

The whole region is the part of the Upper Godawari basin (Fig.2.1). The river Godawari drain through the central part of the division. The Godawari river flows through the district of Jalna, Parbhani, Beed and Nanded district. Godawari forms the southern of Aurangabad district for about 200 kms and separates Aurangabad district from Ahmednagar and Beed districts. The northern part of the Beed district is drained by Godawari. The Godawari enters from west in Nanded district flows through Nanded and the state of Maharashtra and enters in the Nizambad district of Andhra Pradesh.

The major left bank tributaries of Godawari are Purna and Dudhana. Purna is the biggest tributory of Godawari river in the Kannad hills and flows through the northern taluka of Aurangabad district. Purna meets the river Godawari 150 kms down streams. Manjara the another river enamates in the mountains in Patoda taluka and flows along the southern boarder of the Beed district and flows through Osmanabad district. The other notable river of the division are Shivana, Dhenda, Yerbhadra, Gohati, Sindphana, Bendsura, Wan, Sina, Sina, Talwar, Kamil, Rooti, Manyad, Penganga, Ashna, Sita, Lendi, Bori and Banganga.

2.2.3 Climate :

The climatic factors also influence the health directly as well as indirectly. It's chief elements are solar radiation (temperature), air movement (wind, it's pressure etc.), moisture (humidity, fog, dew etc.), precipitation (rain, snowfall etc.) which have direct influence on man's activities. (Mishra R.P.,1970).

Temperature of the Marathwada division is variable in the many parts of the region. It is very high in Nanded, Osmanabad and Parbhani district. The temperature shows low in Aurangabad and Beed districts. Due to climatic variations in the region, death rate also varies from place to place.

MARATHWADA DIVISION

DYSENTRY & DIARRHOEA

RELATION BETWEEN MONTHLY RAINFALL TEMPERATURE & NO. OF DEATHS.

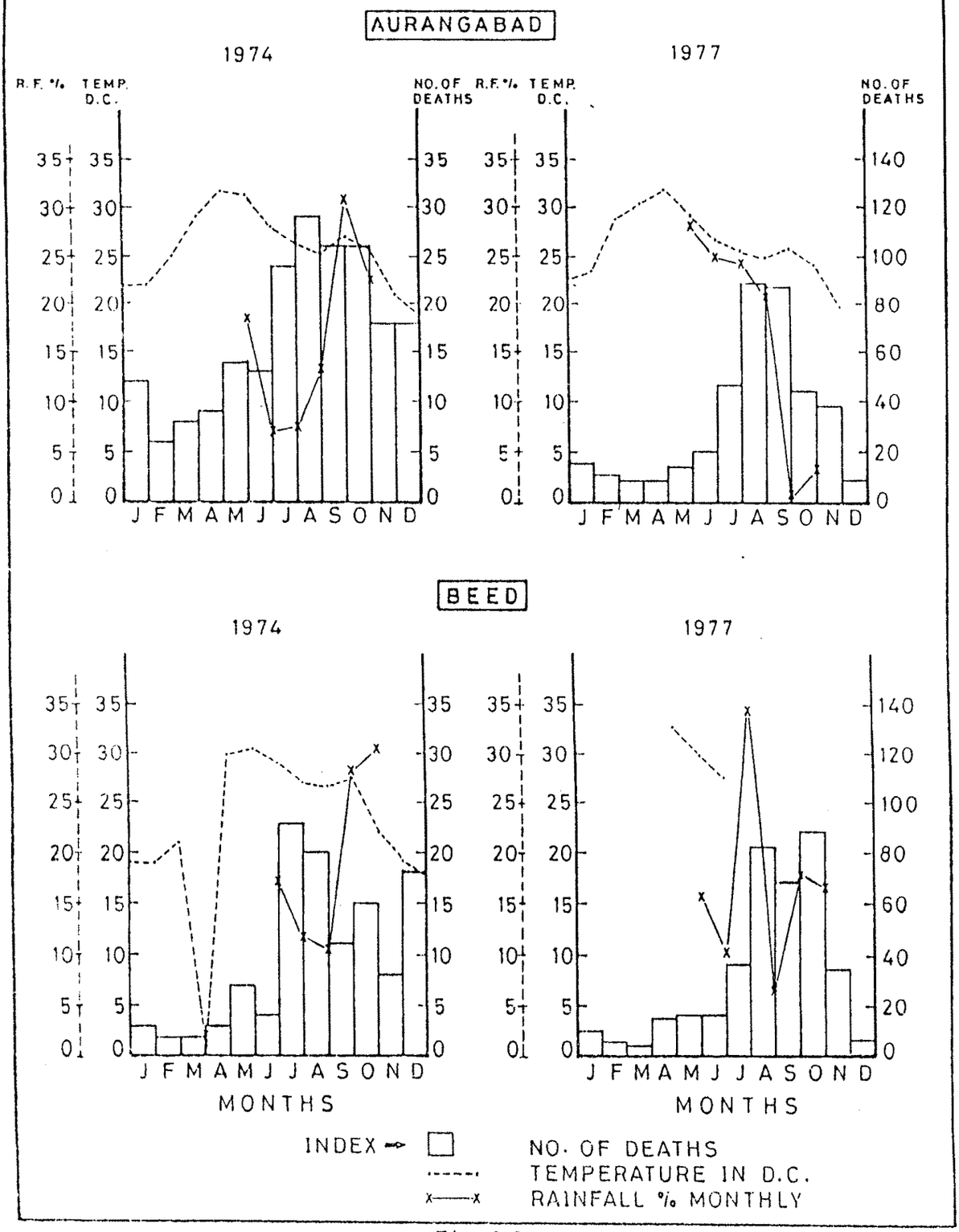


Fig. 2·2

MARATHWADA DIVISION

DYSENTRY & DIARRHOEA

RELATION BETWEEN MONTHLY RAINFALL TEMPERATURE & NO. OF DEATHS.

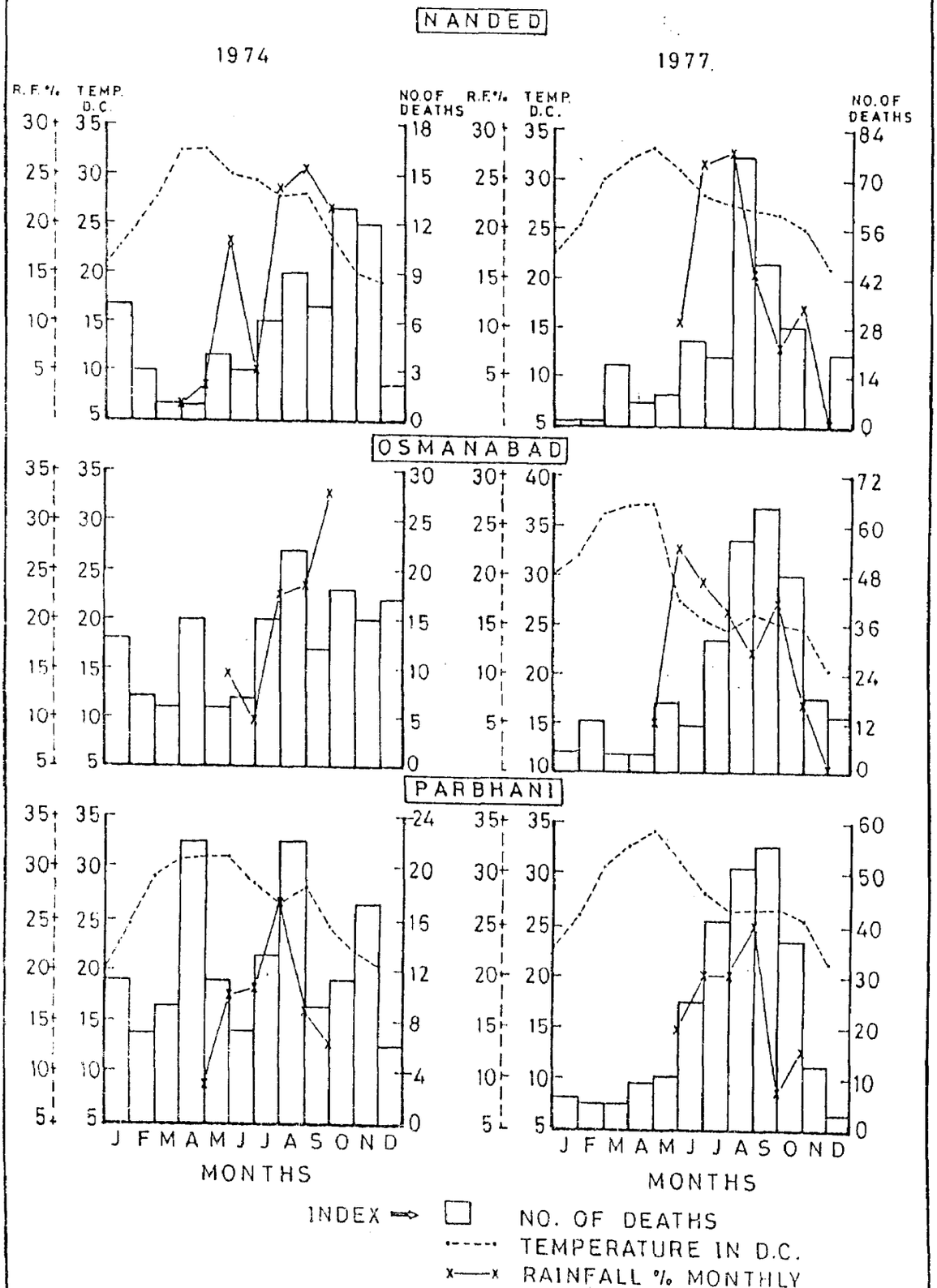


Fig. 2·3

Amongst the chief elements of climate, rainfall alone can modify the health of man and society. The monthly distribution of rainfall and temperature may affect the seasonal distribution of water borne diseases.

Generally high temperature and high humidity contents are responsible for the rapid growth of the diseases. Rainfall plays an important role in causing certain infectious diseases. Temperature of the Marathwada division varies in many parts of the region. It is very high in Parbhani, Nanded and Aurangabad districts. 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 are due to dysentery, diarrhoea, and cholera which occur during rainy season.

Fig.2.2 and 2.3 shows the relation between monthly temperature, percentage of monthly rainfall and the monthly deaths of major water borne diseases namely dysentery and diarrhoea. It is observed that those water borne disease are mainly spreaded during rainy season when the temperature is low i.e. 25°C and monthly rainfall is more than 25 percent of the year.

The southwest monsoon starts in the month of June and more than 85 percent of the annual rainfall occurs in four rainy months viz. June, July, August and September. The mortality rate of dysentery and diarrhoea starts increasing by the

on set of monsoon and reaches to its peak in July and August and then in September death rate decreases. The graph shows the positive relationship between monthly death rate of dysentery and diarrhoea and amount of rainfall. In the Marathwada division death rate of dysentery and diarrhoea diseases seems to be very high in July, August and September.

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. Due to this, 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.) for all districts of Marathwada division for a span of fourteen (14) years i.e. 1974 to 1987 and have been shown in Fig.2.4, 2.5 and 2.6 and in Table 2.1.

In the span of 14 (fourteen) years, the general birth rate is variable in nature. But, it is found that there is successive increase in each district of Marathwada region. The increase takes place especially between 1984 and 1987 and slightly decreases between 1976 and 1980. The general birth rate between 1980 and 1984 remains constant in all the districts of the Marathwada division. The data

VITAL STATISTICAL RATES OF MARATHWADA DIVISION.

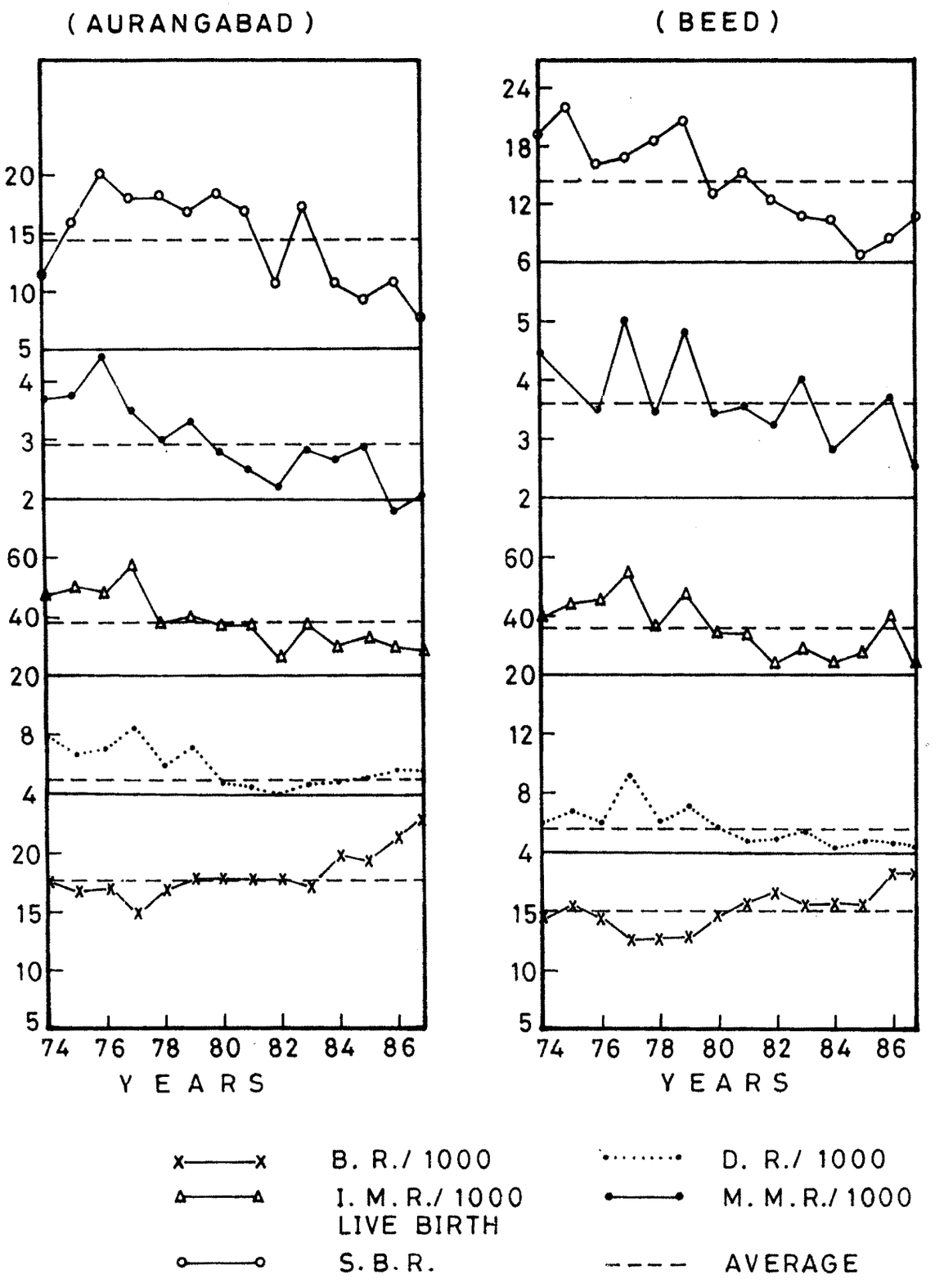


Fig. 2·4

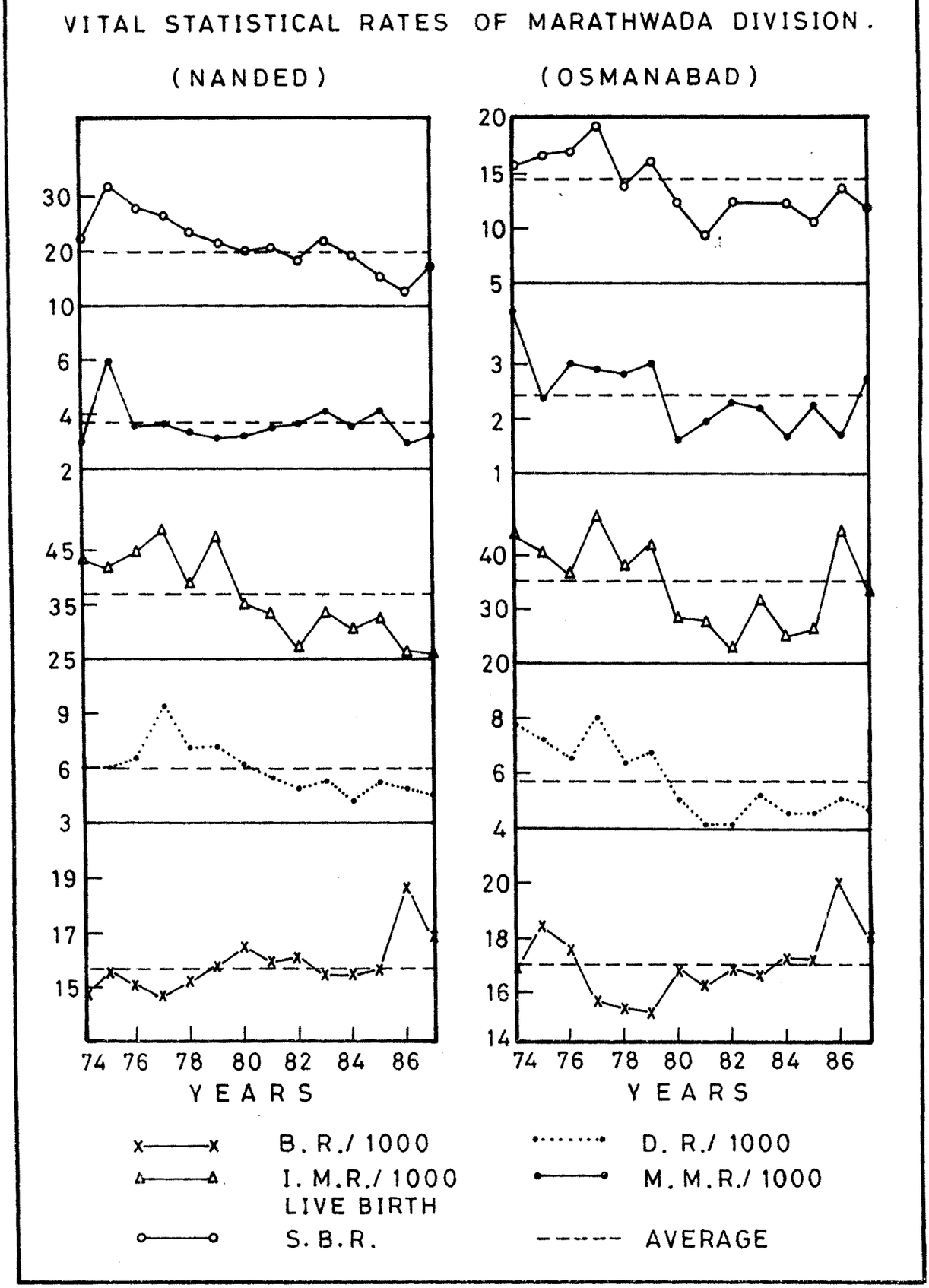

VITAL STATISTICAL RATES OF MARATHWADA DIVISION.
(NANDED)
(OSMANABAD)
30
20
10
6
4
2
45
35
25
9
6
3
19
17
15
20
15
10
5
3
2
1
40
30
20
8
6
4
20
18
16
14
74 76 78 80 82 84 86
YEARS
74 76 78 80 82 84 86
YEARS
B. R./ 1000
D. R./ 1000
I. M.R./ 1000 LIVE BIRTH
M. M.R./ 1000
S. B. R.
AVERAGE

Fig. 2·5

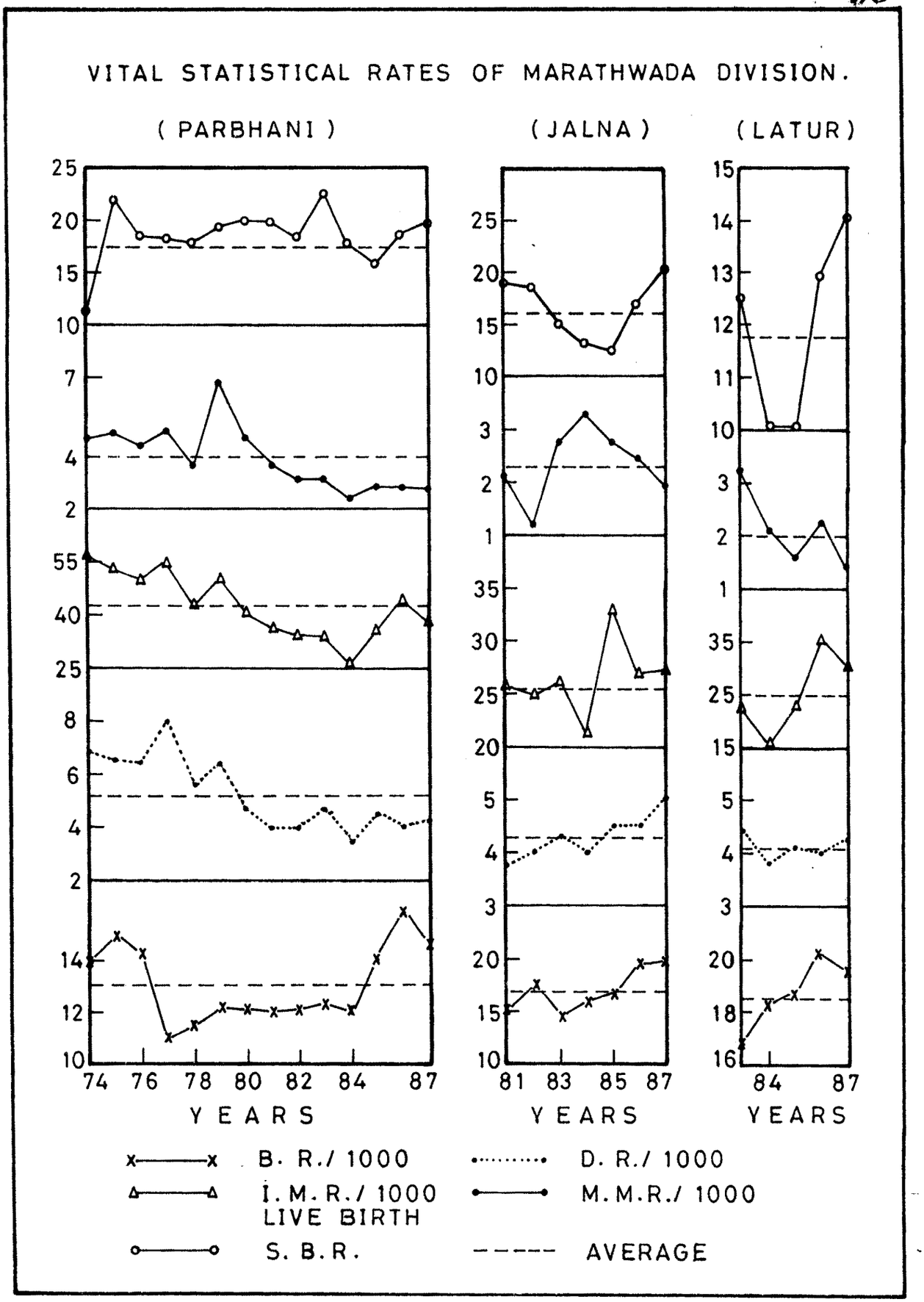

VITAL STATISTICAL RATES OF MARATHWADA DIVISION.
(PARBHANI)
(JALNA)
(LATUR)
25
20
15
10
7
4
2
55
40
25
8
6
4
2
14
12
10
74 76 78 80 82 84 87
Y E A R S
25
20
15
10
3
2
1
35
30
25
20
5
4
3
20
15
10
81 83 85 87
Y E A R S
15
14
13
12
11
10
3
2
1
35
25
15
5
4
3
20
18
16
84 87
Y E A R S
B. R./ 1000
D. R./ 1000
I. M. R./ 1000 LIVE BIRTH
M. M. R./ 1000
S. B. R.
AVERAGE

Fig. 2·6

Table 2.1 : Vital Statistical rates of Marathwada division (1974-87).

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
1974	Division Average	11.21	4.95	33.10	2.8	11.1
	State Average	23.50	8.70	57.00	2.0	19.8
1975	Division Average	11.61	4.77	32.90	3.0	15.3
	State Average	24.00	8.70	58.00	2.1	20.3
1976	Division Average	11.15	4.75	32.00	2.7	14.0
	State Average	23.60	8.30	53.00	2.0	20.5
1977	Division Average	9.95	6.14	37.70	2.9	14.2
	State Average	21.40	9.10	57.00	1.9	20.1
1978	Division Average	10.03	4.45	27.90	2.3	12.7
	State Average	21.30	7.60	48.00	1.9	20.9
1979	Division Average	10.62	4.75	34.00	3.0	13.2
	State Average	22.62	8.30	53.00	2.1	20.7

Conti..

Table 2.1 conti..

1	2	3	4	5	6	7
1980	Division Average	11.17	3.78	25.4	2.2	13.0
	State Average	21.60	6.70	43.0	1.8	20.5
1981	Division Average	13.27	3.88	28.1	2.5	15.7
	State Average	21.50	6.50	42.0	1.6	19.5
1982	Division Average	13.80	3.71	22.0	2.3	12.9
	State Average	21.50	6.10	37.0	1.4	17.5
1983	Division Average	15.48	4.85	33.0	3.2	16.4
	State Average	20.70	6.50	40.0	1.7	19.3
1984	Division Average	16.28	4.24	24.7	2.7	13.3
	State Average	20.50	6.00	36.0	1.5	16.6
1985	Division Average	16.65	4.27	33.0	2.8	11.3
	State Average	20.70	6.20	40.0	1.6	15.9
1986	Division Average	19.17	4.74	35.3	2.5	13.4
	State Average	22.20	6.10	37.0	1.6	16.5
1987	Division Average	18.50	4.65	29.0	2.4	14.5
	State Average	22.60	5.90	33.0	1.3	15.4

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

has been shown for Latur districts since 1983 and for Jalna since 1981. Because these districts came into existance after 1980 and the official data was not available upto the year 1983.

The general death rate of the studied districts in the Marathwada division is variable and slightly increasing till 1980. After 1980 it is in decreasing position. This decrease of general death is due to the availability of medical facilities and increase in the rate of literacy.

In 1982, the infant mortality rate was over in all the districts of Marathwada division, except Jalna district. In 1974 to 1979 the oscillating graph of the infant mortality shows the districtwise variations. Except Jalna and Latur the mortality rate has decreased since 1980. However, in the districts like Beed and Osmanabad the mortality rate increase above the average line for 1986.

As far as maternal mortality rates are considered it is found that there is no any similarity among all the districts of the Marathwada division. However the maternal mortality rates in Aurangabad, Osmanabad and Parbhani districts are slightly similar. Because, it is seen in the graph that in the first half of the span of 14 (fourteen) years the rates are just above the average lines and in the 2nd half they are below the average line. Except in the year 1975 the Nanded districts has constant maternal mortality rate which shows

around the average line in the graph. There are many ups and downs in the Beed districts. In Jalana district the high M.M.R. has been observed in 1984 and it was low in 1982. As well as in Latur district the high M.M.R. is found in 1983 and low in 1987.

The Still Birth Rate in the districts like Beed, Aurangabad, and Osmanabad shows constant decrease and is above the average line in the first half of the study period and below the average line in the 2nd half of the study period. In the Nanded district the S.B.R. is decreasing slowly and gradually since 1976 till 1978. After 1978, it remained constant for next seven years and then it has decreased. In Parbhani S.B.R. was lowest in 1974 and in 1985 it is below the average line. Otherwise in all the years it is always above the average line. In the districts like Latur and Jalna the S.B.R. is the same in the years 1984, 1985 and it has increased suddenly in the year 1986 and 1987.

All the rates except S.B.R. shows a gradual decline through the span of 14 (fourteen) 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.

In the span of 14 (fourteen) years, the general birth rate shows a more variations in its pattern. Table 2.1 shows divisional average and states average of various statistical rates in the Marathwada division. The general birth rate of Marathwada division has increased from 11.21 in 1974 to 18.5 in 1987. But birth rate of the state has decreased from 23.5 in 1974 to 22.6 in 1987.

The division birth rate average was lower than the state average for all the span of fourteen (14) years period.

The general death rate shows slight decrease in the division. The death rate has checked as it was above 3.5 in all districts of Marathwada division. Generally, the death rate was comparatively low in Marathwada division than in state. The gradual decline in death rate indicates the overall well being of the region especially regarding availability of medical facilities.

The problems related to infant mortality rate are more severe and serious in Marathwada division. The infants mortality rates have been calculated per thousand (1000) live births which indicates that there is rapid decline in infant mortality in the Marathwada division. It has decreased from 33.10 per 1000 live births in 1974 to 29.00/1000 live births in 1987. It means the rates have reduced in fourteen (14) years period and the rate of decline is almost constant every year. In future more attention should be paid in improving the infants health in this division.

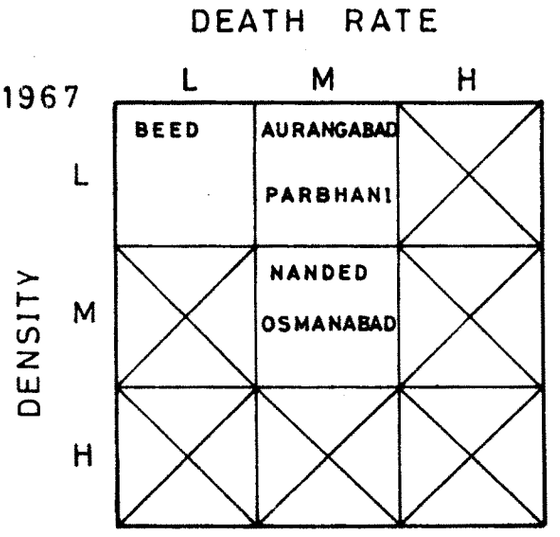
Maternal mortality itself becomes the major cause of infant mortality in the underdeveloped countries like India. There are several causes of maternal mortality namely biological, economical, social or cultural.

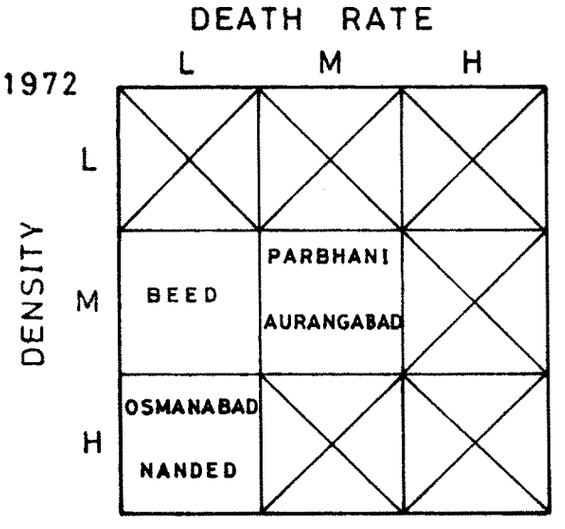
The M.M.R. in Marathwada division has shown variable trend from 2.8 in 1974 to 2.4 in 1987. These divisional maternal mortality rates are higher than the rates of the state. The deaths of mother during the time of delivery are more in Marathwada division than the Maharashtra as whole. Amongst the seven districts of Marathwada, the Parbhani district shows highest M.M.R.

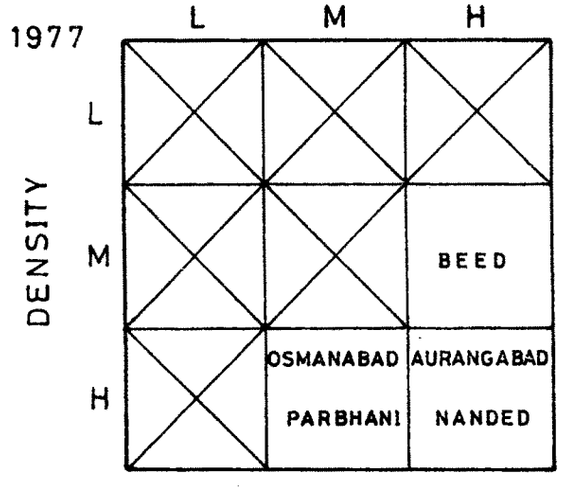
The still birth rates of Marathwada division show increase from 11.1 in 1974 to 14.5 in 1987. It is observed that the still birth rates of state are higher than the divisional averages. The average S.B.R. of the Nanded district was highest among the region which was 31.00/1000 live births was also higher than the state average.

In general, all the rates shows variations inbetween the study period. As compared to other divisions of Maharashtra, the Marathwada enjoys less medical facilities. The localization of PHCs in the mofissil areas and increasing their numbers during the plan periods have been checked the B.R., D.R., I.M.R., M.M.R. and S.B.R. in this region. Attention should be paid seriously to check the increasing births in these districts.

MARATHWADA DIVISION
RELATION BETWEEN DENSITY AND DEATH RATE.







INDEX
DENSITY OF POPULATION PER SQ KMS. L — BELOW 100 M — 101 TO 130 H — ABOVE 130
DEATH RATE PER 1000 POPULATION L — BELOW 6·0 M — 6·1 — 8·0 H — ABOVE 8·1
L — LOW M — MEDIUM H — HIGH

Fig. 2·7

2.4 SOCIO-CULTURAL ENVIRONMENT AND HEALTH :

Socio-cultural factors and health are closely related to each other. Socio-cultural environment influences the health 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 combinations in different areas and different times.

The socio-cultural factors are not as rigid as those 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 Marathwada division. These parameters are, density of population and age structure.

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 densly 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 when 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 shows higher incidences of infectious diseases.

The districtwise relationship between death rate and density has been discussed and is shown in Fig.2.7. In the year 1967 death rate and density was low in Beed district and Aurangabad and Parbhani districts the death rate was moderate and density was low. And Nanded and Osmanabad districts death rate and density are medium.

In 1972 the death rate low and density was medium in Beed districts and moderate death rate and density was found in Parbhani and Aurangabad. The high density and low death rate found in Osmanabad and Nanded districts.

In 1977 high death rate and medium density found in Beed districts and high density and high death rate was found in Aurangabad and Nanded districts. The moderate density and death rate was found in Osmanabad and Parbhani district.

2.4.2 Age :

It is rather difficult to find out the relationship between incidence of particular disease and the age structure.

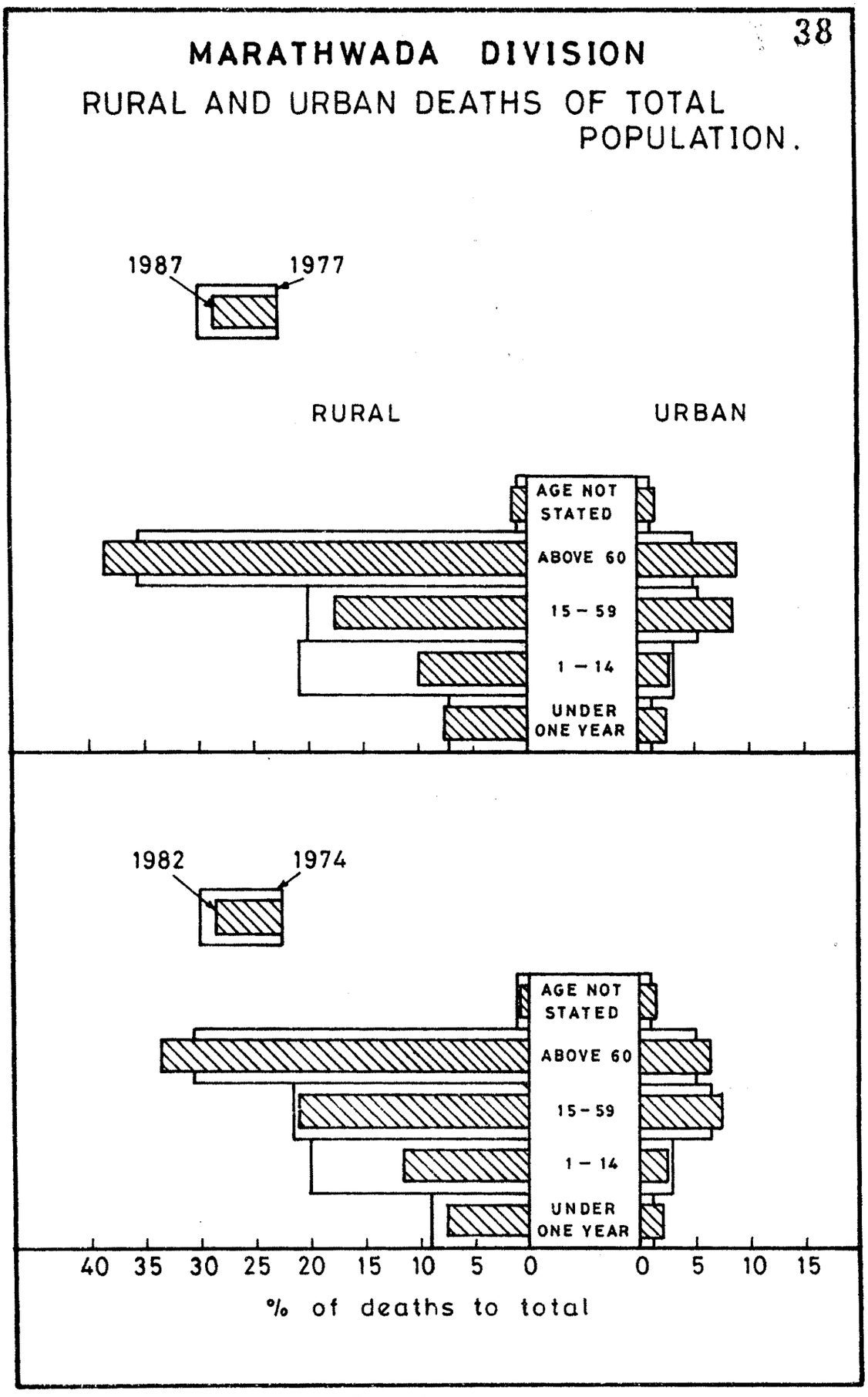

MARATHWADA DIVISION
RURAL AND URBAN DEATHS OF TOTAL POPULATION.
1987
1977
RURAL
URBAN
AGE NOT STATED
ABOVE 60
15 - 59
1 - 14
UNDER ONE YEAR
1982
1974
AGE NOT STATED
ABOVE 60
15 - 59
1 - 14
UNDER ONE YEAR
40 35 30 25 20 15 10 5 0
0 5 10 15
% of deaths to total

Fig. 2·8

Still the study of the age pyramid may give general conclusion about the rural-urban deaths to total population in Marathwada division.

It is stated that the deaths below one year and above 60 years of age are more in both urban and rural areas normally. In 1982/1987 the deaths above 60 years and between 15-59 years of age are more in urban centres of Marathwada division than rural and between 1974 and 1977 the deaths of 1 to 14 years of age was more in rural areas than urban area. This shows that the rural-urban deaths in Marathwada division above 60 years of age are more than any other age groups (Fig.2.8).

2.4.3 Rural and Urban differences :

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

Fig.2.8-A deals with age groupwise percentage of deaths in both rural and urban areas of Marathwada division. It is stated that the deaths below one year are more in urban areas than in rural areas in 1982. In the age group of 1 to 14, the percentage of deaths have been decreased in rural areas from 1974 to 1982. The percentage of deaths between 15 to 59 years has been increased in urban area from 1974 to 1982. But, it shows decrease in rural areas. The deaths

above 60 years of age are more in both urban and rural area. This shows that rural urban deaths in Marathwada division above 60 years of age are more than any other age groups. It is generally stated that with growing age increases the risk of death. The percentage of rural deaths are more than urban deaths. It is true that vast rural population remains devoid of medical facilities. To control this high percentage of deaths in villages, the medical services needed in a large quantity in rural area.

Fig.2.8-B deals with the age groupwise percentage of deaths in both rural and urban areas of Marathwada division. It is stated that the deaths below one year are more in urban areas than rural as compared to 1974 to 1977. The deaths below one year are rapidly increasing in 1987 in rural area In the age group of 1 to 14 the percentage of deaths have rapidly decreased in rural areas from 1977 to 1985. The percentage of deaths above 60 years of age is more in rural and urban areas. The percentage of deaths between 15 to 59 years has been rapidly increased as compared to 1974. This pyramids shows that rural urban deaths in Marathwada division above 60 years of age are more than in any other age groups. It is generally stated that growing age increases the risk of death. The percentage of rural death are more than the urban deaths. It is true that vast rural population remains devoid of medical facilities. To control this high percentage of deaths in villages the medical services are needed in a large quantity in villages.

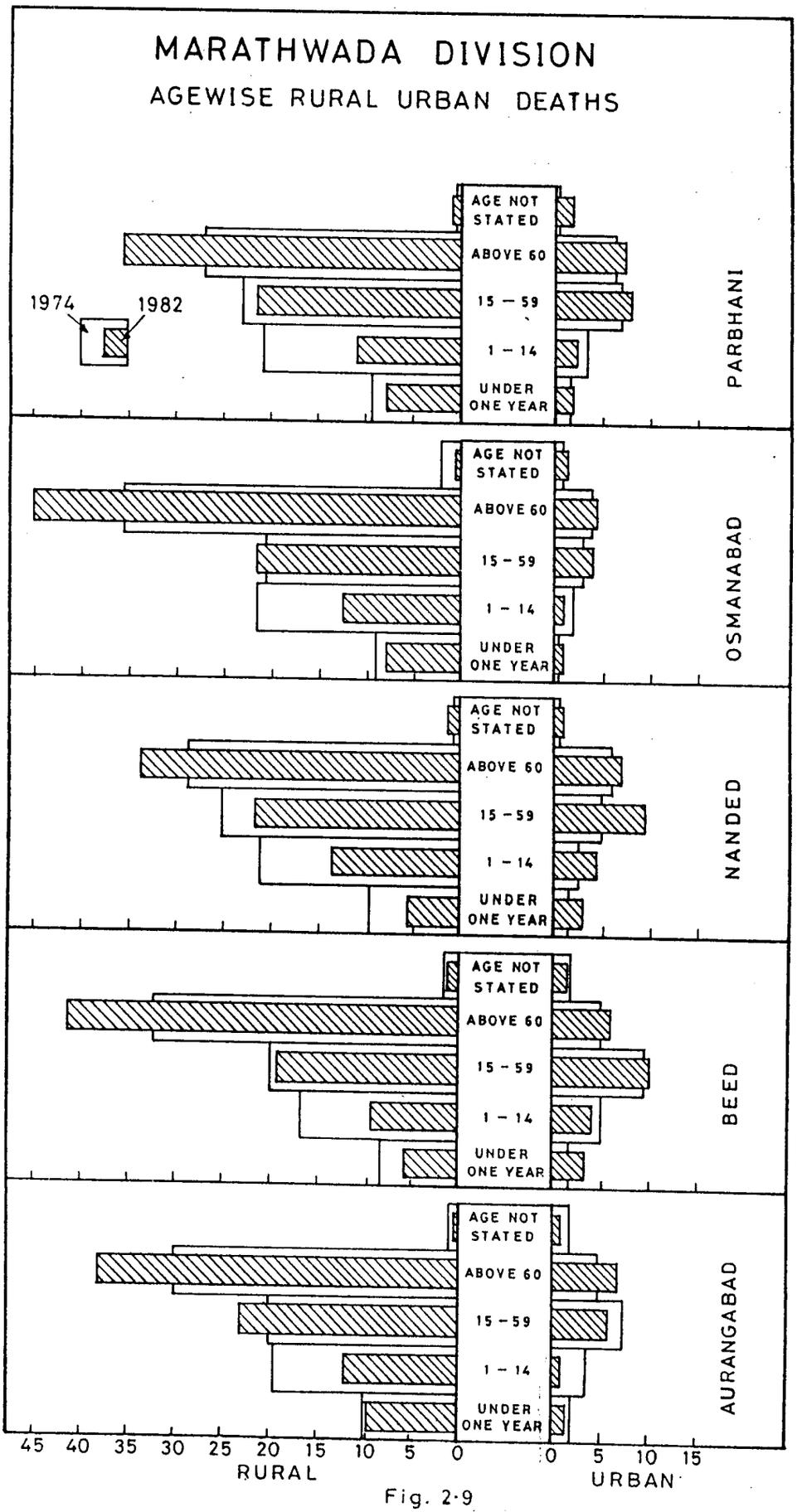


Fig. 2·9

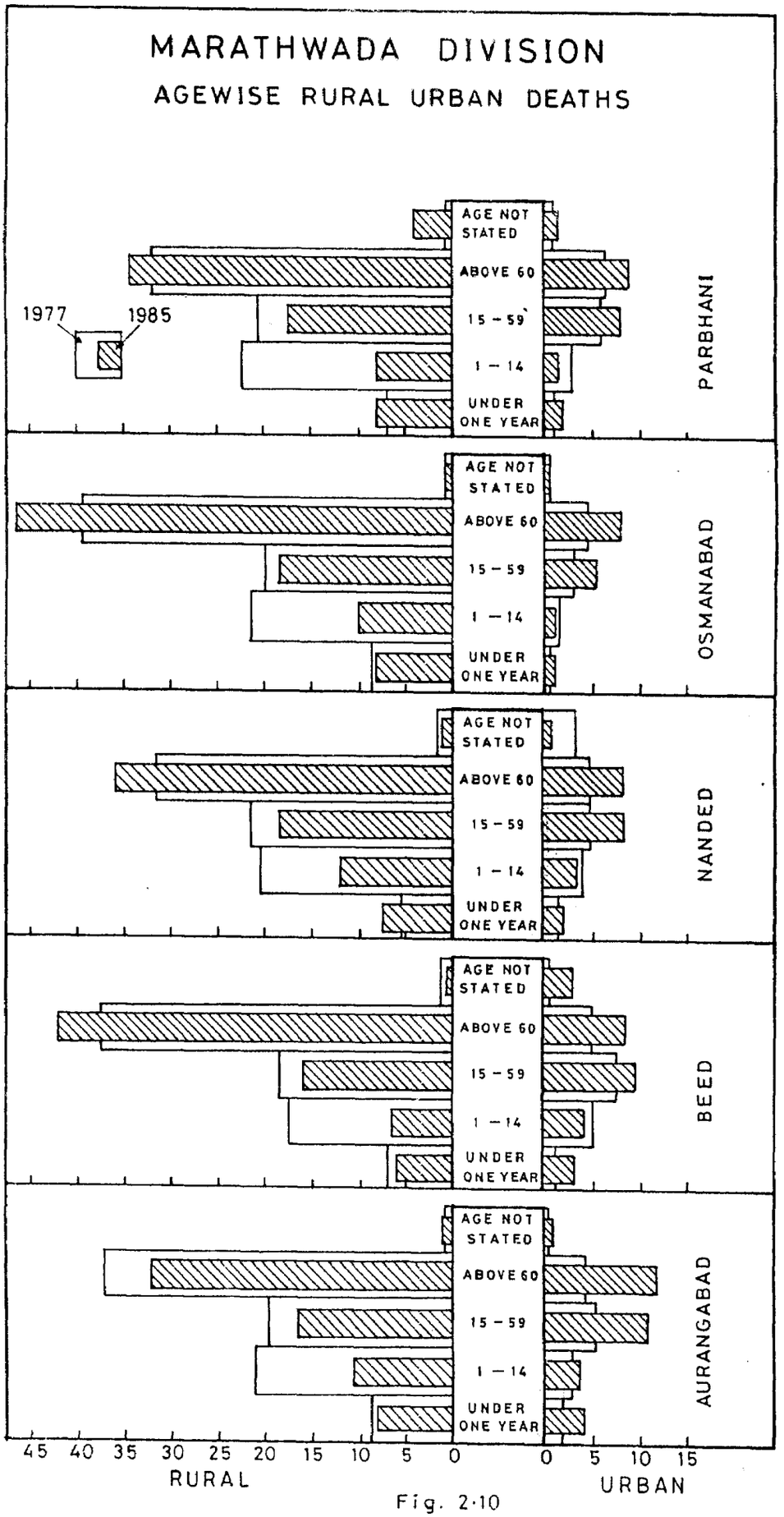

MARATHWADA DIVISION
AGEWISE RURAL URBAN DEATHS
1977
1985
AGE NOT STATED
ABOVE 60
15 - 59
1 - 14
UNDER ONE YEAR
PARBHANI
OSMANABAD
NANDED
BEED
AURANGABAD
45 40 35 30 25 20 15 10 5 0
0 5 10 15
RURAL
URBAN

Fig. 2·10

Fig.2.9 deals with the 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 1982. As well as 15 to 59 years and above 60 years of age are more in 1987 than in 1977. In Osmanabad and Beed districts the percentage of deaths are more in the rural areas than the urban area in the age group of 60 and above. In Beed and Nanded districts percentage of deaths is more in urban areas than in rural areas. The percentage of infants death is more in urban areas of Nanded, Beed and Osmanabad district during 1982. This indicates that in districts of Marathwada division the rural working population is in the weaker cell of health. Rural areas are more victimised than their counterpart.

Fig.2.10 deals 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 age above 60 years are more in 1985 than in 1977. In rural areas Osmanabad, Beed, Nanded and Parbhani districts of the percentage of deaths above 60 and more in 1985. The percentage of infants death is more in urban areas of districts of all Marathwada division in 1985. This indicates that in districts of Marathwada 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 the 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 the percentage of deaths of ten (10) major diseases in the particular years. Cause specific death rates of various diseases have been calculated for the fourteen (14) years per 100,000 population. Districtwise average death rates have been calculated for each year. While considering the percentage of deaths by each diseases, ranks has been given for those particular diseases from 1st rank to 10th rank.

Fig.3.10 and 3.11 shows that tuberculosis, cancer and pneumonia are the dominant diseases in the Marathwada division. Amongst them, T.B. is of serious nature which has remained in the first rank in almost all the districts of Marathwada division. Pneumonia and cancer show IInd or IIIrd in rank in all the districts of Marathwada division. The diseases like diarrhoea and tetanus rank IVth and Vth in all districts of Marathwada division. The disease measle ranks VIth in order. Leprosy, dysentery, cholera and malaria generally occupy VIIth, VIIIth and IXth and Xth rank respectively.

This ranking technique shows that T.B., cancer, pneumonia and diarrhoea are the diseases which have highly emerged out in this Marathwada division. T.B., cancer, pneumonia and diarrhoea are also the serious diseases in Marathwada division.

2.5.2 Districtwise ranking of diseases :

The study of diseases ranking may be very useful in understanding the distribution in the districts of Marathwada division. The study may provide an idea of relative dominance of different diseases in order of importance.

The ranking techniques used here, are based on mortality rates calculated for particular diseases in particular year and for particular district. For example (Fig.3.10) in 1974 in Aurangabad, Jalna, Nanded, Latur, and Parbhani districts the number of deaths are due to tuberculosis which is highest in amongst all, hence this disease has been given the first rank. While the lowest number of deaths are occurred by dysentery during the same year. Hence dysentery is given the last rank i.e. VIII or IX or Xth. Accordingly, for each disease yearwise ranks have been calculated and are shown in Fig.3.10 and 3.11.

The districtwise ranking technique shows that cancer with which deaths rates are remarkable stands 2nd in the rank order. The eradication of malaria and cholera has been noticed in Marathwada division since 1976.

The districtwise technique shown here depicts that T.B., cancer and pneumonia are the dominant diseases of the Marathwada division. Amongst them, T.B. is of serious nature which remained first in their rank in the districts of Jalna, Aurangabad, Nanded, Latur and Parbhani districts remained second in the districts of Beed and Osmanabad in its rank of 14 years period. Pneumonia also shows its remarkable influence in this region, particularly Jalna, Aurangabad, Nanded and Parbhani districts. It has been remained IInd in Jalna and IIIrd in Aurangabad, Nanded and Parbhani districts. The eradication of cholera has been noted in the Marathwada division since 1975.

Considering the average ranking order during 1974 to 1987, the following three groups of diseases with varying intensity can be brought out as follows -

A) Diseases of higher ranking order :

(Ist to IIIrd rank)

i) Tuberculosis

ii) Cancer

iii) Pneumonia

B) Diseases of moderate ranking order :

(IVth to VIth rank)

iv) Diarrhoea

v) Tetanus

vi) Measle

C) Diseases of low ranking order :

(VIIth to VIIIth rank)

vii) Leprosy

viii) Dysentery

D) Diseases which have been eradicated (since 1975) :

ix) Cholera

x) Malaria

2.5.3 Citywise ranking of diseases :

An idea of relative dominance of different diseases in order of importance may be provided with the study of ranking of diseases. This technique is based on the calculated mortality rates for particular diseases in particular year and for particular city.

The data have taken into consideration for the period of fourteen (14) years (1974-87) and also for six (6) years for some cities. For example (Fig.4.11) in 1974 in Beed city, the number of deaths due to tetanus were highest amongst all, hence this disease has been given the first rank in 1974 while number of deaths of cancer during the same year are lowest amongst all hence for cancer, the last rank is allotted i.e. Vth. Accordingly, for each disease yearwise ranks are calculated and are shown in Fig.4.11 to 4.12.

Table 4.1 shows diseasewise ranking of cities for the period (1974-87) and Table 4.2 indicates citywise ranking of

different diseases for the period of 14 years (1974-87). Total ten diseases are considered for the study.

Generally, it is observed that in almost all the cities the death rate by tuberculosis, tetanus, pneumonia, cancer and diarrhoea are higher in orders during these fourteen (14) years (1974-87) period. Except Parli-Vaijnath and Udgir all the cities have T.B. in the first rank.

Tetanus is also dominant in Ambejogai city. Pneumonia has also created serious problems which ranks IInd or IIIrd in the cities like Aurangabad, Jalna, Latur, Nanded, Osmanabad and Parbhani. The disease, cancer is also in 4th or 5th in the rank in the cities like Ambejogai, Aurangabad, Beed, Latur and Udgir. As per the collection of data 1974 to 1987, ranking order shows the following groups of diseases with varying intensity.

1) Diseases of high ranking order -
   - i) Tuberculosis
   - ii) Tetanus
   - iii) Pneumonia
   - iv) Cancer
   - v) Diarrhoea
2) Diseases of moderate ranking order -
   - vi) Leprosy
   - vii) Dysentery
   - viii) Measle

3) Disease of low ranking order -

ix) Cholera

x) Malaria

2.6 CONCLUSION :

While studying the physical and social factors and their affect on the distribution of diseases in Marathwada region, it is found out that low death rate is found in the hilly areas comprising of some parts of Ajanta and Balaghat ranges, while river plains have high incidences of the Upper Godavari plain comprising the central region of the Marathwada division have higher incidences of water borne diseases. It is found out that climate acts as a major factor in the distribution of diseases personwise. The number of deaths starts increasing at the on-set of mansoon when the incidence and proliferation of water borne diseases is more. The total number of deaths are more in rainy season than in non-rainy season.

The analysis of socio-cultural factors in relation to distribution of diseases reveals that, the number of deaths in the working age group and that of old age above 60 years are rapidly increasing. It is also noted that 1 to 14 years age group of male population in the most safest age group in the Marathwada division as the number of deaths are minimum. The rural death rate is comparatively much higher

than the urban deaths. Non-availability of medical services in the rural areas increases. The general mortality rate of the Marathwada division, the rural population of the working age group (i.e. 15 to 59 years of age) is much victimised by some major diseases like T.B., cancer, diarrhoea, pneumonia and tetanus.

The districtwise and citywise cause specific death rate and the ranking technique show that diarrhoea, T.B. and cancer are the major diseases of the Marathwada region. Amongst them, T.B. was of serious nature which remained first in their rank, cancer and pneumonia have ranked 2nd and 3rd in the list. While cholera and Malaria have been eradicated from the region.

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