# CHAPTER-VIII

## CHAPTER - VIII LEPROSY IN VADODARA DISTRICT

### 8.1 Disease Detection :

Under the National Leprosy Control Programme (NLEP), two types of case finding method are followed. One is active case finding which depends on identification of patient following total population survey in endemic areas. Nearly 83% of leprosy cases are detected in this manner. The remaining 17% are registered through passive case finding. Passive case finding is largely dependent on voluntary reporting. The fact that the percentage of passive case finding is less than active case finding, may be attributed to several possible reasons. Firstly, it may be due to lack of knowledge regarding the disease among the sufferers, secondly, due to the stigma attached to this disease, as a result of which people are not willing to report for fear of disease, and thirdly, due to the absence of medical aid in the vicinity. How far these assumptions are valid will be noted in the subsequent discussions.

The active case finding is usually done by leprosy health workers either in group or individual surveys. Thus four types of survey are undertaken, contact survey

is done among persons living with the sufferers, general survey or mass survey is done at random within poplation resiging in any area, industrial survey is confined to industrial areas of the district particularly in urban centres, while school survey is basically confined to schools in order to detect disease among children. In Vadodara district no paticular industrial survey has been conducted. Thus as already noted in Table 7.12 general survey accounts for the highest number of cases (54.0%) followed by contact survey with 18%, self-reporting by 17% and school survey with 11%.

**8.2 Epidemiological status of Leprosy :**

The epidemiological status of leprosy in Vadodara district based on secondary data is given in table 8.1

Table 8.1 Details about Survey in Vadodara district.

| Year | Total popu. of the district | Total popu. examined | % of popu. examined | Total No.of cases detec. | Total MB cases detec. | Total detec. rate/ 10000 | MB case rate in % |
|---|---|---|---|---|---|---|---|
| 1985-86 | 2768959 | 284371 | 10 | 369 | 147 | 13 | 40 |
| 1986-87 | 2824338 | 361777 | 13 | 359 | 100 | 10 | 28 |
| 1987-88 | 2880824 | 484129 | 17 | 661 | 50 | 14 | 8 |
| 1988-89 | 2938440 | 962370 | 33 | 745 | 86 | 8 | 12 |
| 1989-90 | 2997208 | 467556 | 16 | 510 | 82 | 11 | 16 |
| 1990-91 | 3057152 | 335663 | 11 | 488 | 85 | 15 | 18 |
| 1991-92 | 3118295 | 855279 | 27 | 345 | 86 | 4 | 25 |
| 1992-93 | 3180660 | 1254946 | 39 | 485 | 98 | 4 | 20 |

Source : Population data from Vadodara districts census handbook-1981.

: Leprosy data from district Leprosy office of Vadodara.

Figre 8.1 examines the percentage of population surveyed and total cases detected through survey. It is apparent that the case detection showed only minor fluctuations during the period 1988-89 to 1990-91, and dropped considerably from 91-92 indicating a sharp fall in cases. Another interesting feature is that when the percentage of population examined is high, the detection rate is low; whereas, when the population examined is less, the detection rate is high. This suggests that in the years of high detection rates, the leprosy workers had conducted surveys in the leprosy-prone areas of the district only and hence with minimum effort they could detect maximum cases of leprosy. In the other years, surveys were conducted in areas where leprosy is not a major problem. This leads to the conclusion that frequent survey is very necessary in the leprosy prone areas for continuous monitering of case. So while formulating any eradication policy, this point should to be consdiered as a priority.

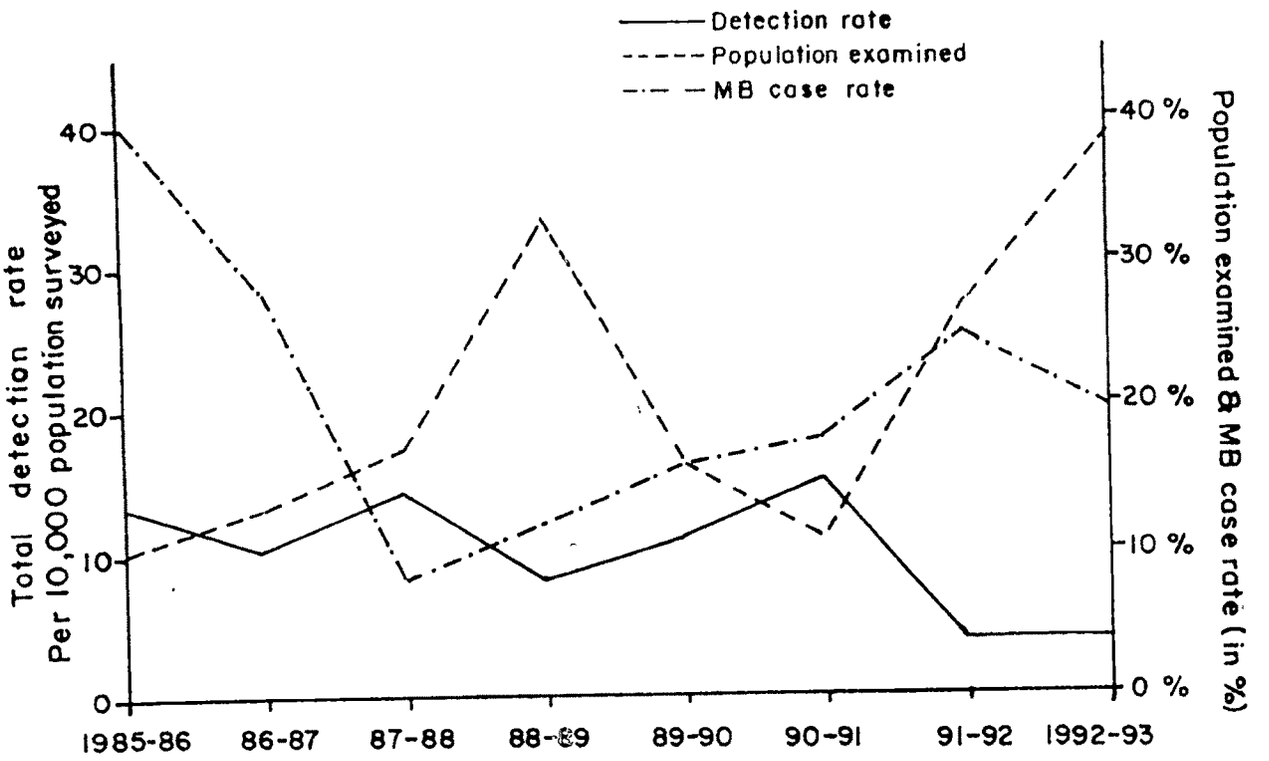

Detection rate
Population examined
MB case rate
Total detection rate
Per 10,000 population surveyed
Population examined & MB case rate (in %)
0
10
20
30
40
0 %
10 %
20 %
30 %
40 %
1985-86
86-87
87-88
88-89
89-90
90-91
91-92
1992-93
Years

Fig. 8·1

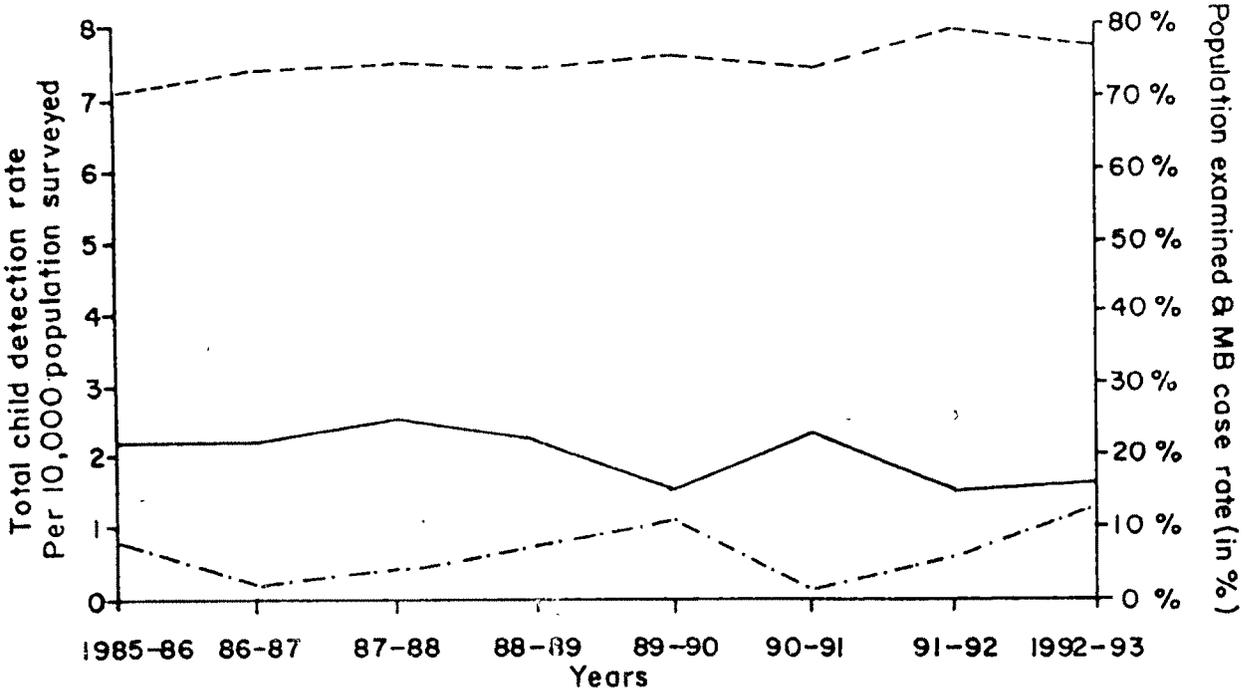

Total child detection rate
Per 10,000 population surveyed
Population examined & MB case rate (in %)
0
1
2
3
4
5
6
7
8
0 %
10 %
20 %
30 %
40 %
50 %
60 %
70 %
80 %
1985-86
86-87
87-88
88-89
89-90
90-91
91-92
1992-93
Years

Fig. 8 2

The MB case rate which was very high in 1985-86 declined considerablly by 1987-88, but is showing an increasing trend parallel to the over-all detection rate between 1988 and 1990, it continued to peak even when the latter rate began to decline. This is disturbing factor which indicates the necessity for more effective implementation of the MDT programme.

In order to know the position of leprosy among children with in the district, the secondary information collected from school survey in Vadodara is compiled in table 8.2.

It was found that the percentage of child population surveyed has always remained high, ranging between 71 and 79 percent. The total detection rate is generally low and similar in trend to the adult detection rate (figure 8.2). The MB cases detected among children also is low; but is showing a slightly increasing trend since 1991 as shown in figure 8.2.

Table 8.2 Survey details done in the schools within Vadodara district.

| Year | Estimated popu. of school going children | Child popu. examined | % of child popu. examin. | Total child cases detec. | Total child dete. rate/ 10000 | Total MB cases detec. | MB case rate % in % |
|---|---|---|---|---|---|---|---|
| 1985-86 | 150634 | 106972 | 71 | 24 | 2.2 | 2 | 8.3 |
| 1986-87 | 219890 | 162653 | 74 | 37 | 2.2 | 1 | 2.7 |
| 1987-88 | 254019 | 191745 | 75 | 49 | 2.5 | 2 | 4.0 |
| 1988-89 | 235297 | 175154 | 74 | 40 | 2.2 | 3 | 7.5 |
| 1989-90 | 298815 | 227935 | 76 | 36 | 1.5 | 4 | 11.1 |
| 1990-91 | 329821 | 243437 | 74 | 56 | 2.3 | 1 | 1.7 |
| 1991-92 | 275328 | 218862 | 79 | 34 | 1.5 | 2 | 5.8 |
| 1992-93 | 301794 | 233927 | 77 | 39 | 1.6 | 5 | 12.8 |

Source : District Leprosy Office of Vadodara.

### 8.3 Geographic Distribution :

Leprosy was evident in Vadodara district from pre-independence time as per records maintained in the district leprosy office of Vadodara. But systematic records were maintained with the begining of the eighties. According to information provided from the district authority, with the introduction of multidrug therapy (MDT), there has been a dramatic reduction in the number of leprosy cases. But for the first time in the history of modern medicine, a consistent decline in the prevalence and incidence rate has been recorded during the last ten

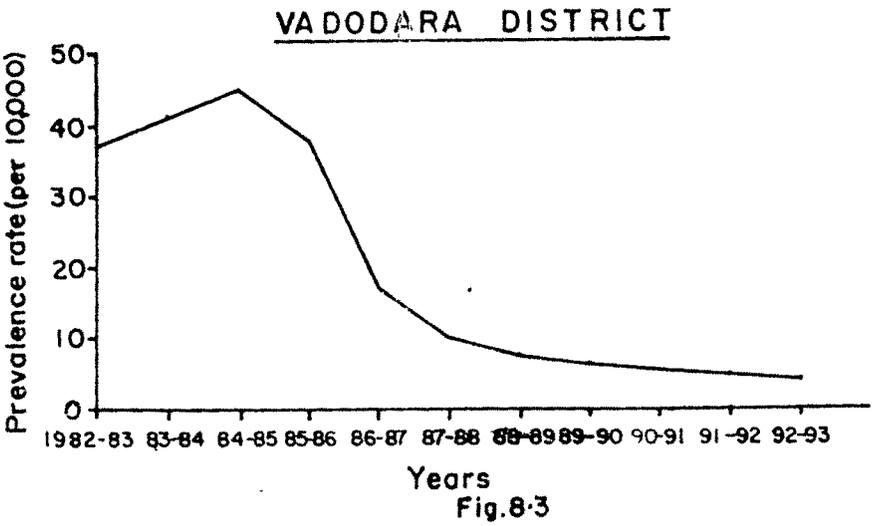



Fig.8·3

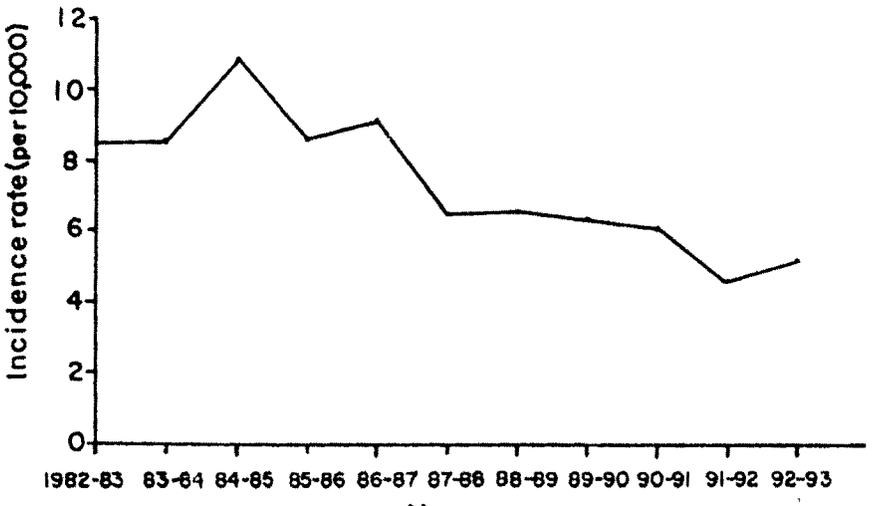



Fig.8·4

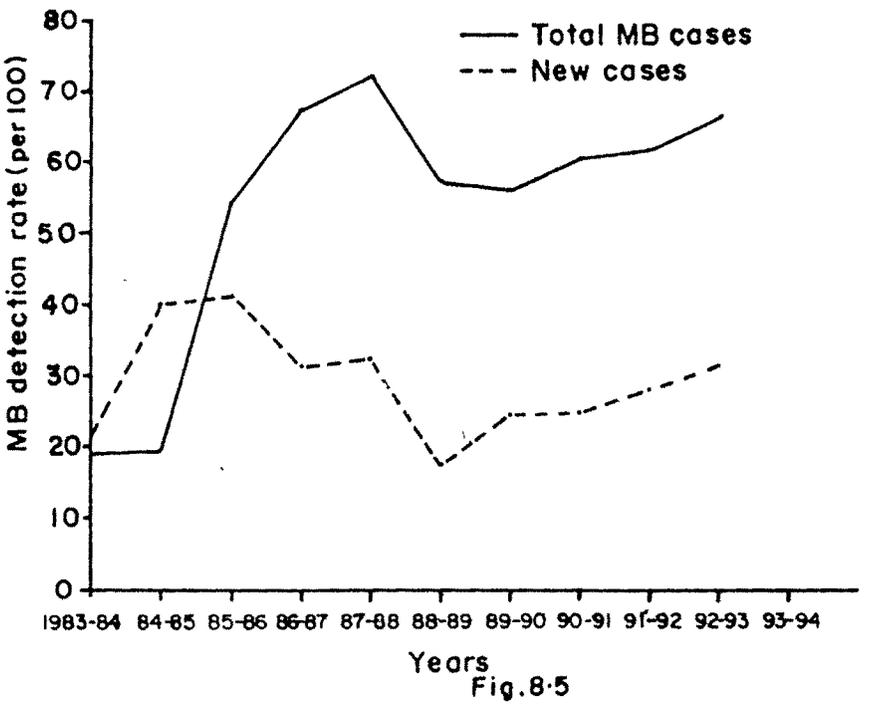



Fig.8·5

years as shown in table 6.2. Figure 8.3 & 8.4 show the decreasing trend of both prevalence and incidence rate of Vadodara district. But actually the rate of infectious cases (MB type) had an increasing trend as shown in figure 8.5 for both, total MB cases and new MB detected cases. Thus this could be the reason that inspite of reduction of the case load, there is a constant emergence of new cases with in the district. To know which areas of the district are the constant source of infection, talukawise classification of cases becomes necessary.

From 1985-86 to 1988-89, due to combined administrative units for the purpose of leprosy control, it was very difficult to distinguish the exact number of cases by talukas as is evident from the prevalence, incidence, total MB and new MB detection rates shown in figure 8.6, 8.7, 8.8, & 8.9 But since 1989-90 the administrative units were organised taluka-wise and hence it became easier to know the areal pattern of distribution in Vadodara district.

Taking talukawise average of each rate and later grouping them into three categories by simple division technique as low, moderate and high, the classiffications

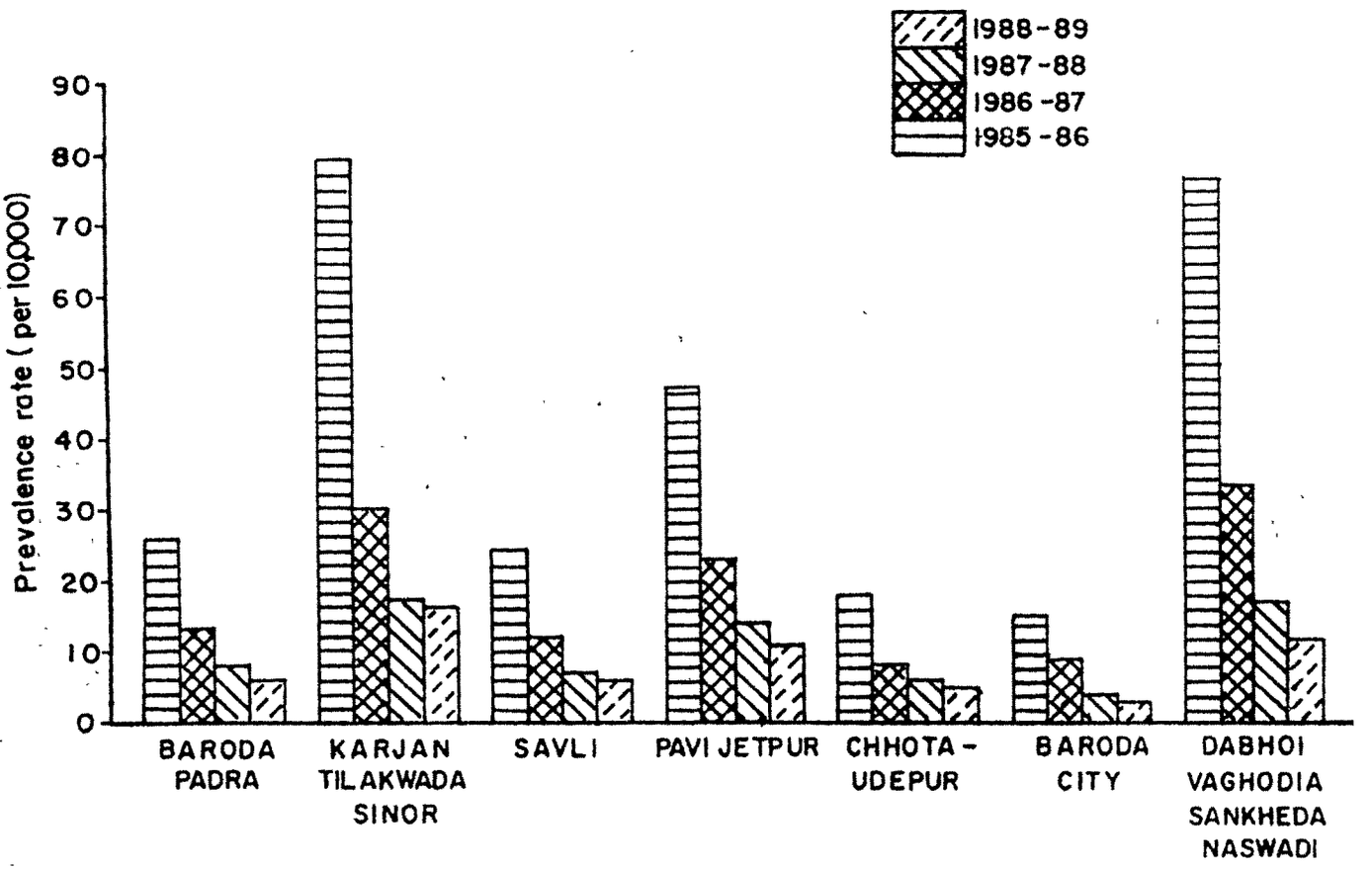

1988-89
1987-88
1986-87
1985-86
Prevalence rate ( per 10,000)
90
80
70
60
50
40
30
20
10
0
BARODA PADRA
KARJAN TILAKWADA SINOR
SAVLI
PAVI JETPUR
CHHOTA-UDEPUR
BARODA CITY
DABHOI VAGHODIA SANKHEDA NASWADI

Fig. 8·6

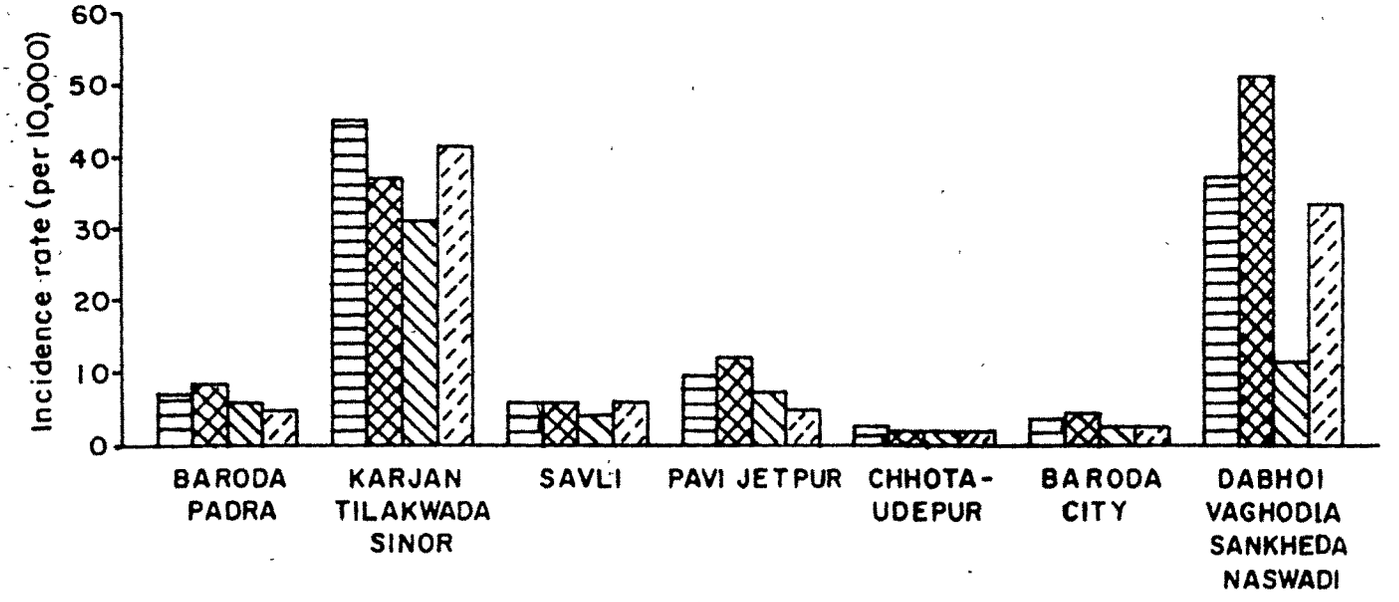

Incidence rate (per 10,000)
60
50
40
30
20
10
0
BARODA PADRA
KARJAN TILAKWADA SINOR
SAVLI
PAVI JETPUR
CHHOTA-UDEPUR
BARODA CITY
DABHOI VAGHODIA SANKHEDA NASWADI

Fig. 8·7

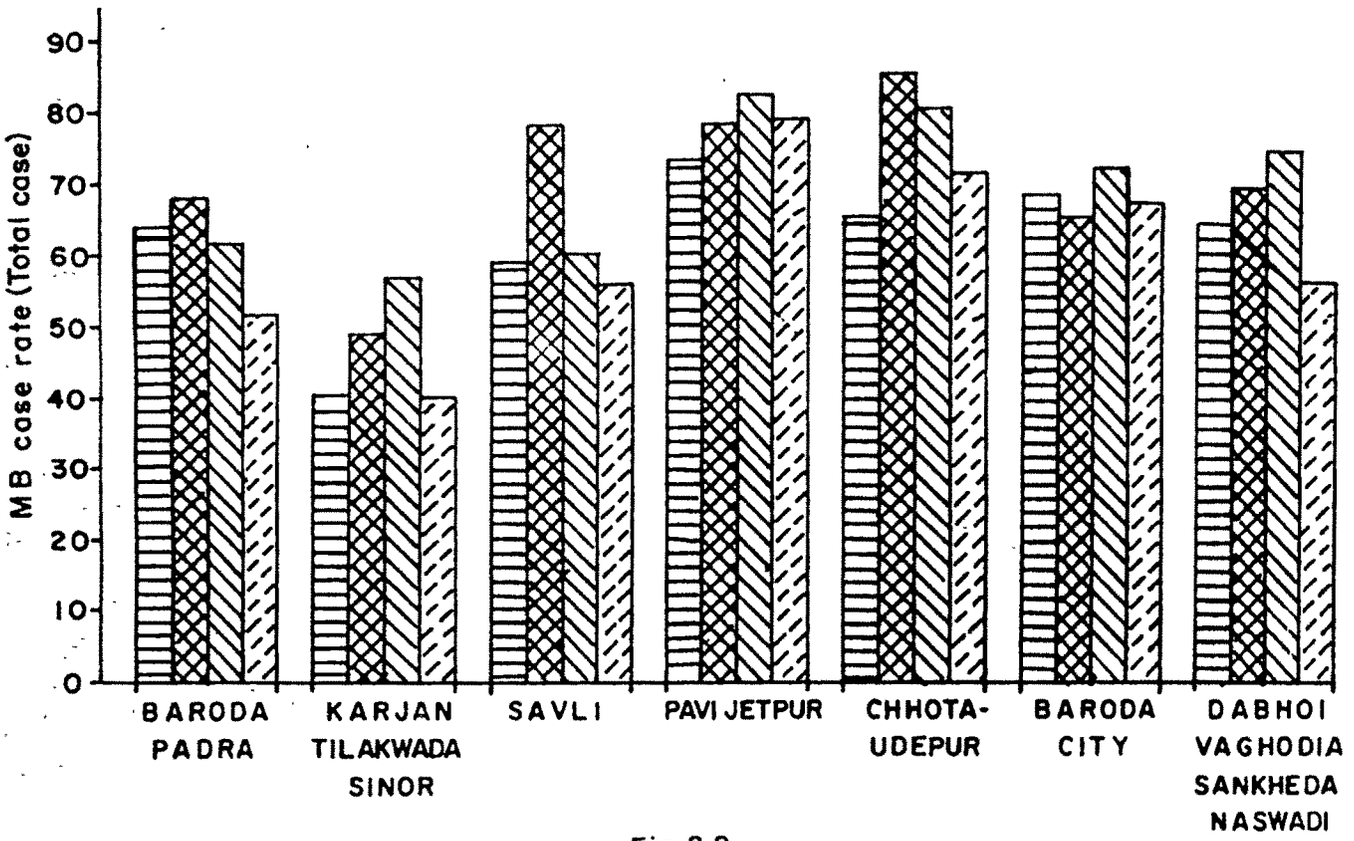

MB case rate (Total case)
0
10
20
30
40
50
60
70
80
90
BARODA PADRA
KARJAN TILAKWADA SINOR
SAVLI
PAVI JETPUR
CHHOTA-UDEPUR
BARODA CITY
DABHOI VAGHODIA SANKHEDA NASWADI

Fig.8·8

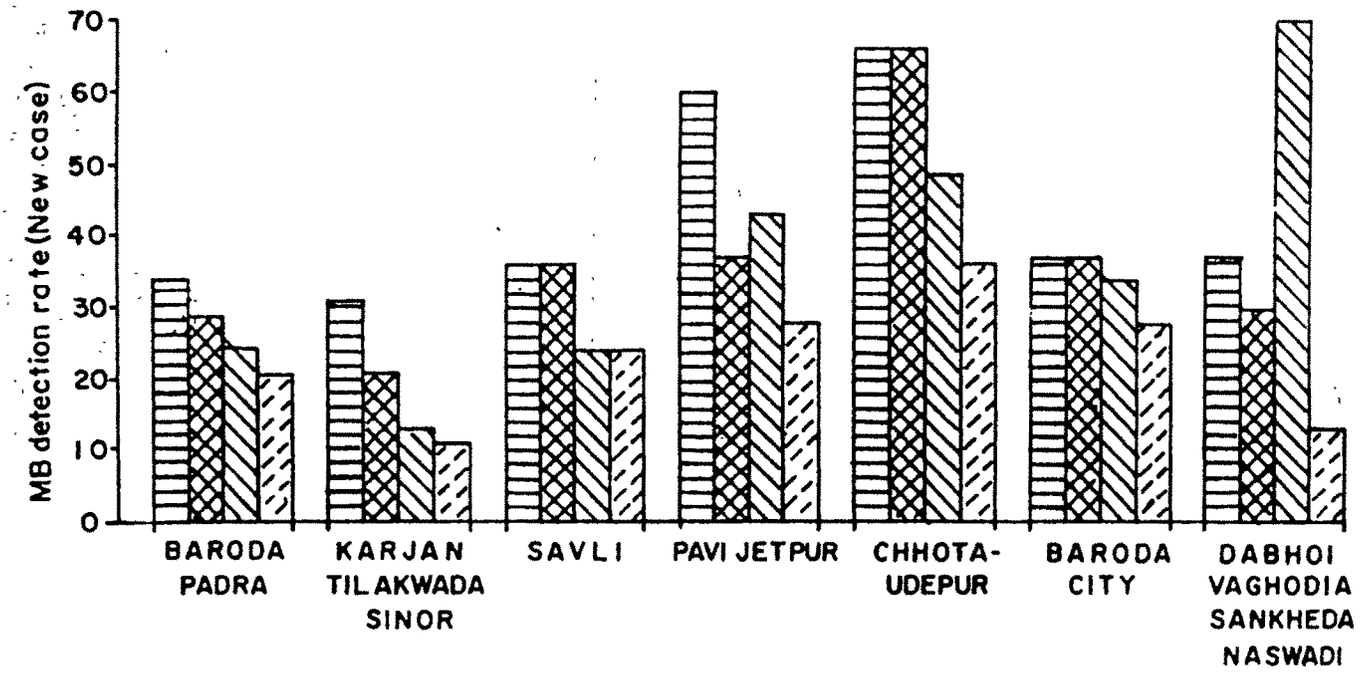

MB detection rate (New case)
0
10
20
30
40
50
60
70
BARODA PADRA
KARJAN TILAKWADA SINOR
SAVLI
PAVI JETPUR
CHHOTA-UDEPUR
BARODA CITY
DABHOI VAGHODIA SANKHEDA NASWADI

Fig.8·9

derived are as shown in the table 8.3

Table 8.3 : Leprosy situation in Vadodara District, 1989-90 to 1992-93 by talukas.

| Leprosy Parameter | | Name of the Taluka |
|---|---|---|
| 1. Prevalence Rate/10,000 | | |
| Low | (0-5.2) | Padra, Chotta Udepur, Vadodara(U) and Naswadi. |
| Moderate | (5.3-10.4) | Vadodara (R), Karjan-Tilakwada-Sinor, Pavi Jetpur and Vaghodia. |
| High | (10.5+) | Savli, Dabhoi and Sankheda. |
| 2. MB cases Rate (%) | | |
| Low | (0-22.9) | Nil |
| Moderate | (22.9-45.8) | Nil |
| High | (45.9+) | All Talukas of Vadodara district. |
| 3. Incidence Rate/10,000 | | |
| Low | (0-6.2) | Padra, Chotta Udepur, Vadodara (U) and Naswadi. |
| Moderate | (6.3-12.4) | Vadodara (R), Savli, Pavi Jetpur, Dabhoi, Vaghodia and Sankheda. |
| High | (12.5+) | Karjan-Tilakwada-Sinor. |
| 4. New MB cases Rate(%) | | |
| Low | (0-11.9) | Nil |
| Moderate | (12-23.8) | Karjan-Tilakwada-Sinor, Chotta Udepur, and Naswadi. |
| High | (23.9+) | Vadodara (R), Padra, Savli, Pavi Jetpur, Vadodara (U), Dabhoi, Vaghodia and Sankheda. |

Note : R-Rural and U-Urban.

From figure 8.10 and table 8.3, it is quite evident that Savli, Dabhoi and Sankheda taluka had high prevalence rates (P.R) in almost all the year, while Vadodara, Pavi-

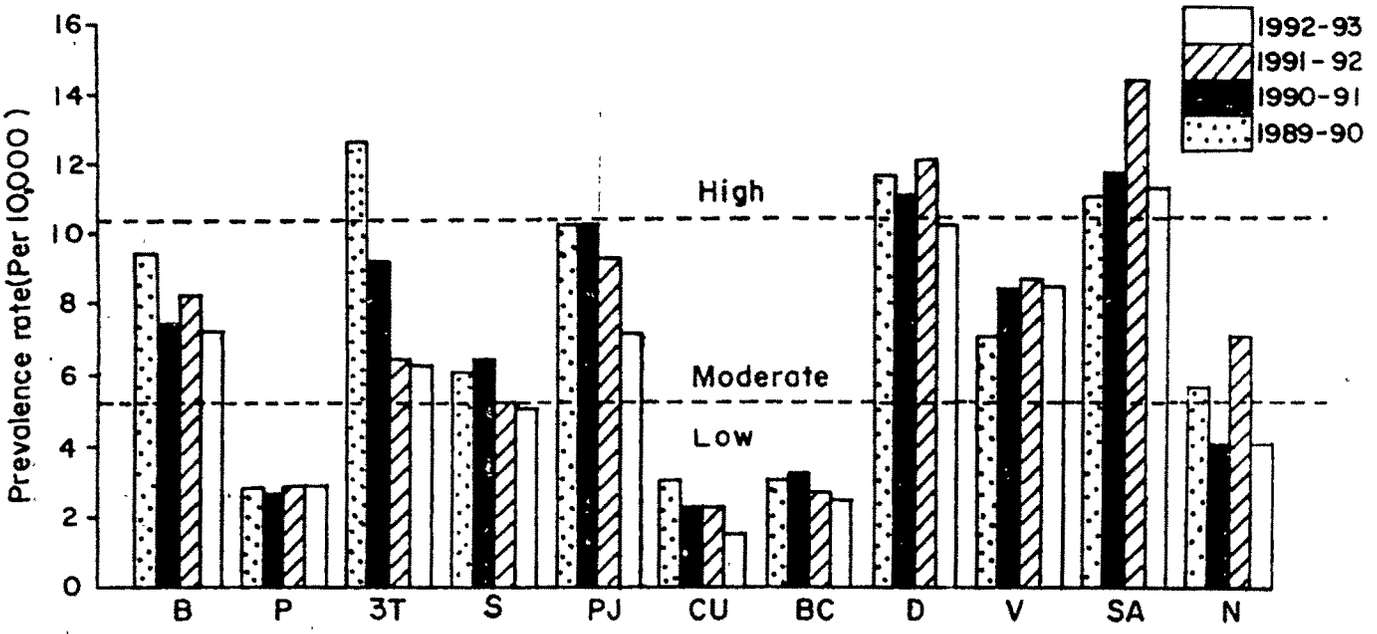
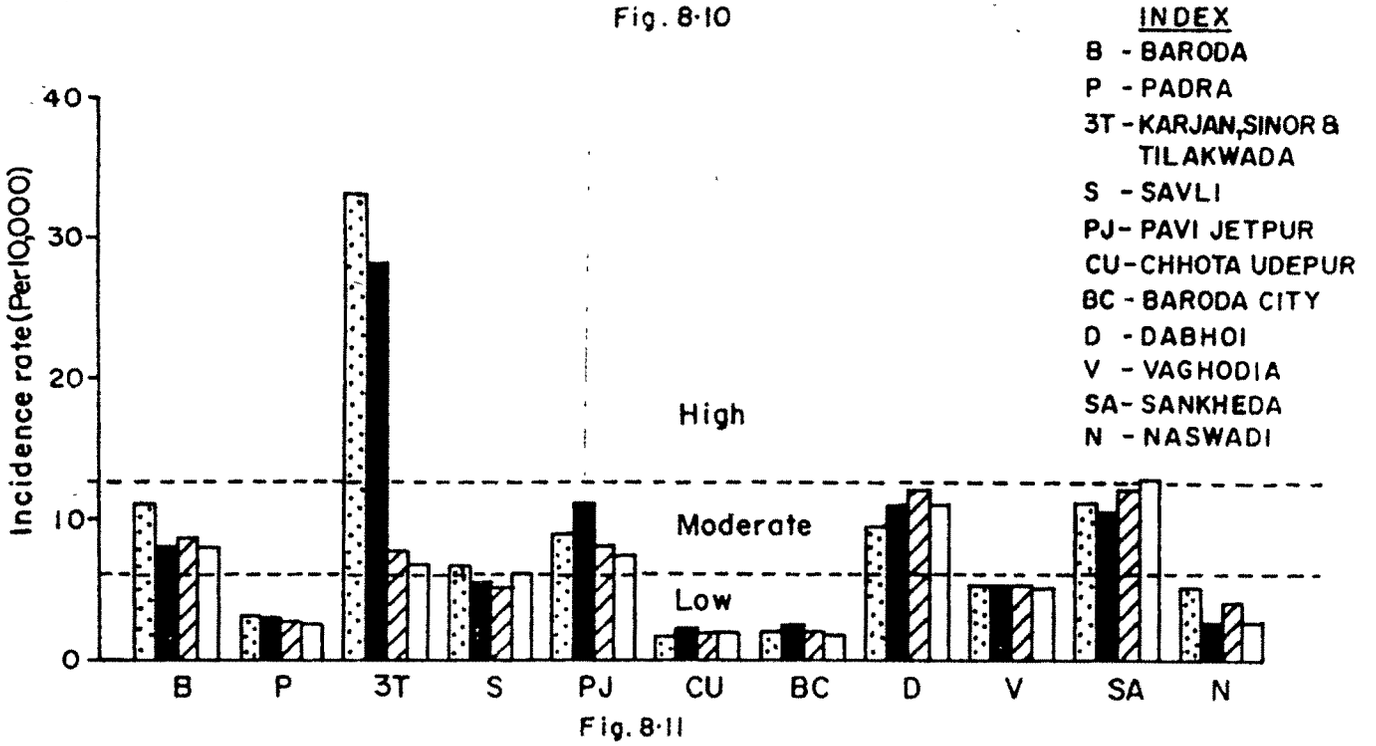



Fig. 8·10




INDEX

B - BARODA
P - PADRA
3T - KARJAN,SINOR & TILAKWADA
S - SAVLI
PJ - PAVI JETPUR
CU - CHHOTA UDEPUR
BC - BARODA CITY
D - DABHOI
V - VAGHODIA
SA - SANKHEDA
N - NASWADI

Fig. 8·11

Jetpur, Vaghodia, Naswadi and Karjan-Tilakwada, Sinor combined fall in moderate PR category and rest (Padra, Chhota Udepur and Vadodara city) talukas are in low P.R category. The incidence rates (I.R) noted from figure 8.11 indicate that Karjan-Tilakwada-Sinor combined talukas fall in high category, while the talukas of Vadodara, PaviJetpur, Dabhoi, Vaghodia and Sankheda fall in moderate category, followed by Padra, Savli, Chhota Udepur, Naswadi and Vadodara city fall in low category. Thus it seems that position of talukas for I.R is totally different from P.R.

From figure 8.12 it is quite amazing to know that almost all talukas fall in the high category of MB case rate suggesting that in all talukas, sufficient number of infectious cases (MB) are present and this could be the reason for the emergence of new cases of leprosy with in all talukas of Vadodara district.

Figure 8.13 gives quite interesting result of new MB (new case) detection rate. No taluka falls in low category of new MB case detection rate. Naswadi, Chhota Udepur and Karjan-Tikakwada-Sinor combined talukas fall under moderate category and all the remaining talukas fall under

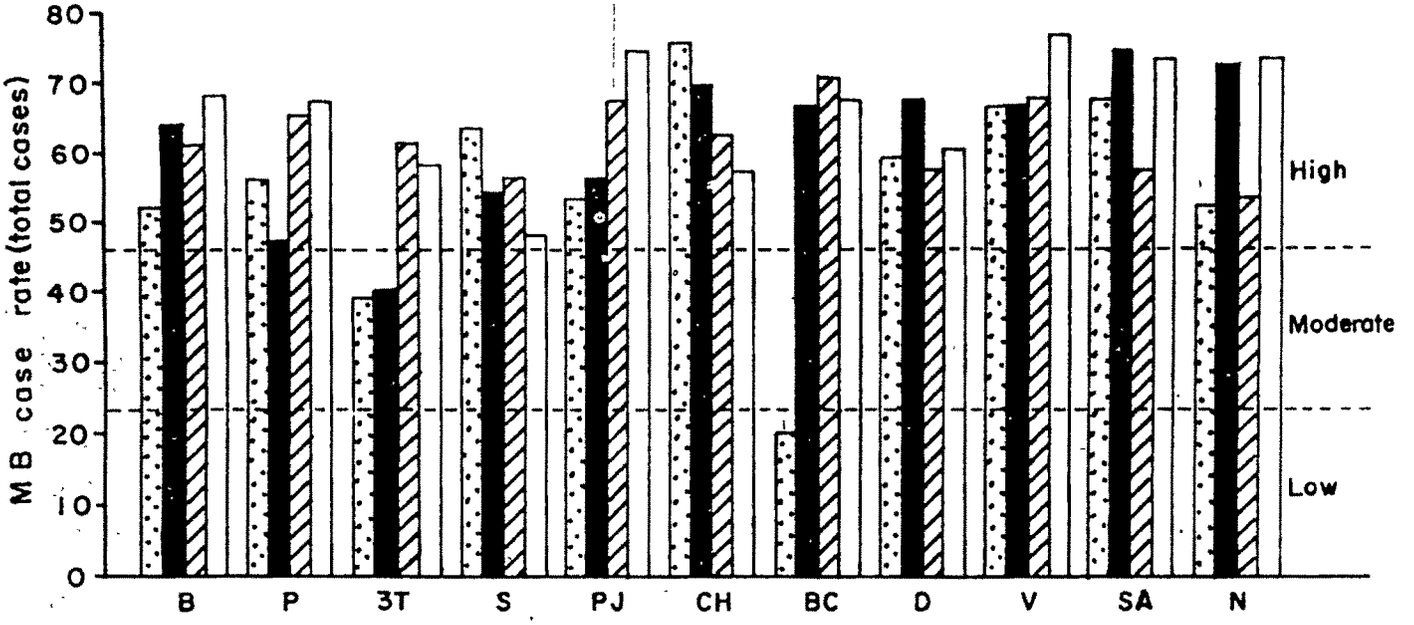



Fig.8-12

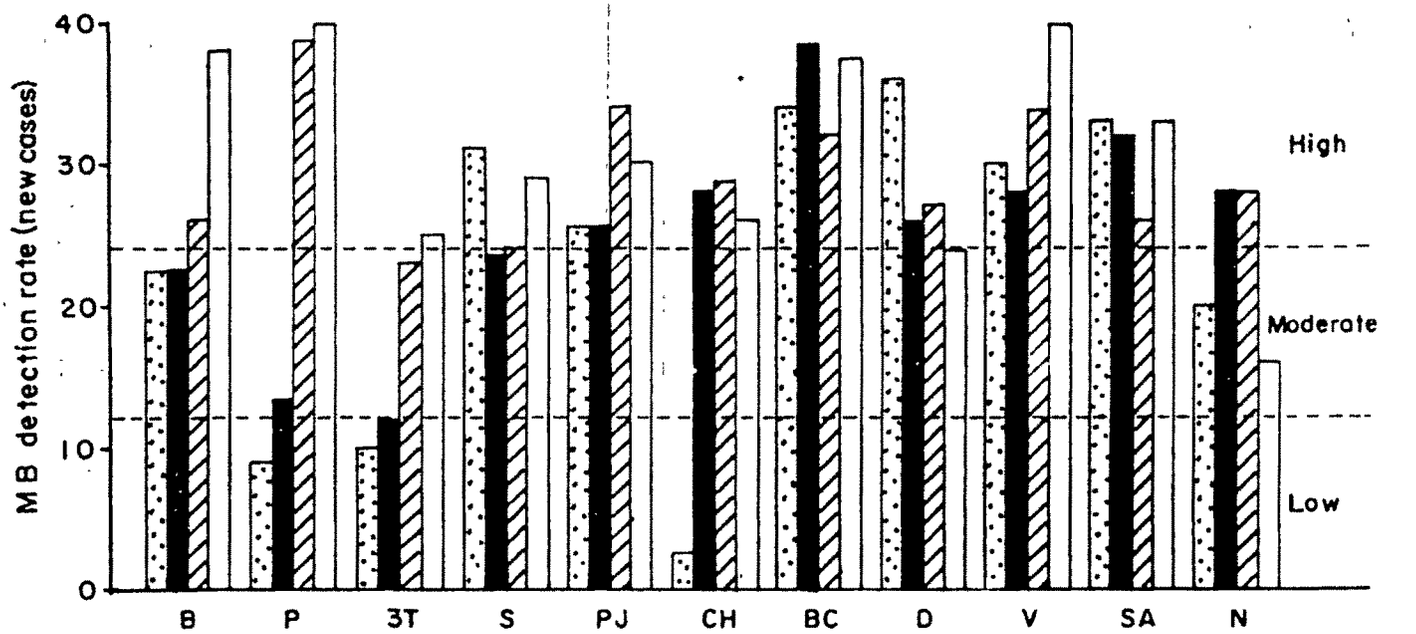



Fig.8-13

high category of new MB case detection rate.

This suggests that the latter group of talukas, Viz, Vadodara Savli, Pavi-Jetpur, Dabhoi, Vaghodia, Sankheda together with Vadodra city, can be the endemic areas of the district, since there is constant emergence of new infectious type of cases from these areas. However the prevalence rate in all these talukas is not necessarily high. So if both PR and new MB case rate are considered in combination, it is found that Savli, Dabhoi, and Sankheda have high rates of both Hence this three talukas may be endemic focii, while Vaghodia, Pavi jetpur and Vadodara rural with moderate PR and high MB case detection rate, can also be considered as being on the fringes on endemicity.

In case of Vadodara urban area in spite of the low prevalance rate, the MB detection rate is high. This could be due to the continued migration of cases to the urban area for treatment and thereby greater detection of MB cases. Cure is also higher in the urban centre and many patients return to their villages after obtaining treatment; and therefore the PR remains low.

## 8.4 Distribution of Leprosy in Vadodara City :

In 1981 the municipal corporation had divided Vadodara city into eight wards as shown in table 8.4

Table 8.4 Wardwise position of Leprosy in Vadodara city.

| Name of the Ward | 1 Total pop (1981) | 2 Area (Sq Km) (1981) | 3 Popula. Density per Km | 4 Slum pop. (1981 | 5 Total cases | 6 P.R/1000 Total area | 6 P.R/1000 Slum area | 7 % of pop pop at risk |
|---|---|---|---|---|---|---|---|---|
| City | 64831 | 0.65 | 99740 | - | 6 | 0.09 | - | - |
| Fatepura | 119465 | 11.68 | 10228 | 16068 | 43 | 0.36 | 2.7 | 13.4 |
| Wadi | 112735 | 9.58 | 11768 | 4143 | 25 | 0.22 | 6.0 | 3.6 |
| G.I.D.C | 77457 | 29.77 | 2602 | 2844 | 31 | 0.40 | 11.0 | 3.6 |
| Babajipura | 74476 | 4.95 | 1546 | 865 | 13 | 0.17 | 15.0 | 1.2 |
| Sayajigunj(S) | 61957 | 25.08 | 2410 | 9130 | 46 | 0.74 | 5.0 | 14.7 |
| Sayajigunj(N) | 128559 | 21.07 | 6102 | 2815 | 31 | 0.24 | 11.0 | 2.1 |
| Raopura | 94993 | 5.48 | 17335 | 6755 | 21 | 0.22 | 3.1 | 7.1 |
| Total of Vadodara City | 734473 | 108.26 | 6786 | 42620 | 216 | 0.29 | 5.0 | 5.8 |

Note : Information in coloumn 1 to 4 was taken from. Vadodara district census hand book, 1981.
: Nearly all cases were detected in slum.

In Vadodara city, the prevalence rate of leprosy is only 0.29 per thousand population. But if observed among population living in slum areas which is most susceptible

## DISTRIBUTION OF LEPROSY IN VADODARA CITY
## (APRIL 1992 to MARCH 1993)

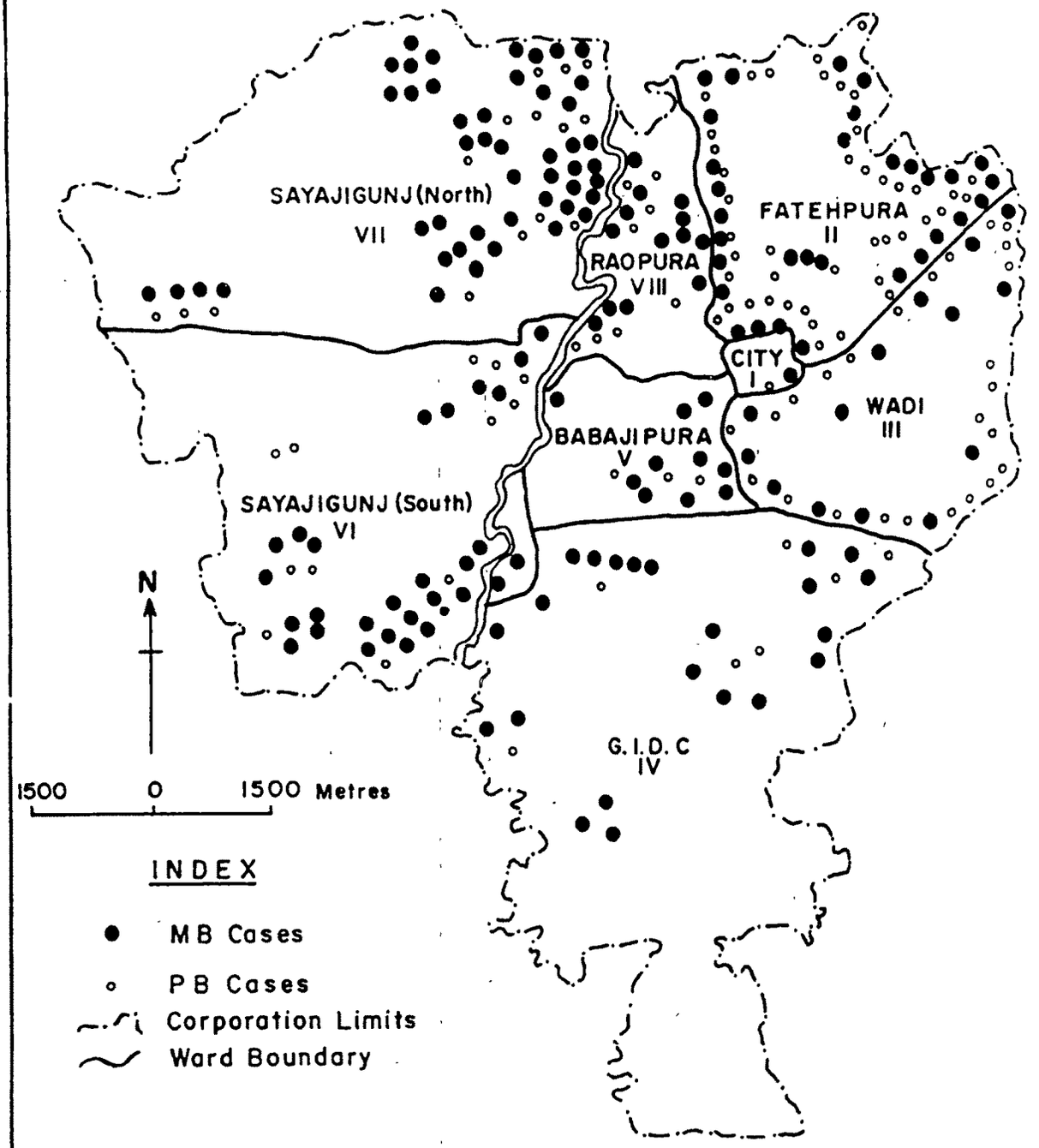



Fig. 8-14

to the diseases and constitutes the population at risk, the leprosy prevalence rate is 5 cases per thousand population. Figure 8.14 shows distribution of active leprosy cases in Vadodara city. It is observed that about 50% of the leprosy cases in Vadodara city are coming from new developing or peripheral areas such as the wards GIDC, Sayajigung (S) and Sayajigung (N). while remaining 50% of the leprosy cases are from older areas of Vadodara city, viz, Fatepura, Wadi, Raopura and Babajipura. It was also noted that slums are mostly located either near garbage dumps as in the old parts of the city or near 'nallahs' or other low lying areas in the periphery.

**8.5 Distribution of Leprosy Cases by age and sex :**

Leprosy occurs in all age groups. Earlier studies made in different parts of the world as mentioned by R.C.Hasting, 1985, shows that children are more susceptible to leprosy. Simillarly males have been reported to be getting leprosy 2 or 3 times more than females. In terms of total number of cases adults compared to children and males compared to females would be more vulnerable. A similar type of finding is evident in the present survey as shown in table 8.5.

Age of onset of leprosy is a somewhat subjective information based upon the memory, intelligence, appreciation and awarness of the patient and his relatives. From the table 8.5 it is quite evident that the age group 31-35 years had highest number of cases (12.3%) followed by 10-14 year age group (11.5%) and 41-45 year age group (11.4%). Thus it becomes very difficult to judge which age cohort is most susceptiable. In order to find the susceptiable period these age groups have been divided into five major categories:

| Age | Age Group | Leprosy Cases Number | % |
|---|---|---|---|
| 0-14 | Children | 134 | 17.4% |
| 15-25 | Adolscent | 103 | 13.3% |
| 26-35 | Youth | 178 | 23.1% |
| 36-55 | Mature | 282 | 36.6% |
| Above 56 | Elderly | 73 | 9.6% |
| | Total | 770 | 100% |

This classification indicates that more than 50% of cases occur in the younger age groups. It therefore indicates that susceptibility is more in the early stages of life. A large majority of the cases noted in the later

Table 8.5 : Leprosy cases surveyed in Vadodara District classified by Age, Sex and Type of cases

| Sr. No. | Age Group | Total Cases | | Total Cases | | Total Cases MB | | | | Total Cases PB | | | | Total Cases Male | | Total Cases Female | | Total No. of Cases (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | M | F | MB | PB | M | F | M | F | MB | PB | MB | PB | | | | | |
| 1 | 0-1 | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – |
| 2 | 2-3 | 2 (0.9) | – | – | 2 (0.9) | – | – | 2 | – | – | 2 | – | – | 2 (0.9) | | | | |
| 3 | 4-9 | 26 (5.4) | 17 (5.7) | 5 (1.7) | 38 (10.7) | 2 | 3 | 24 | 14 | 2 | 24 | 3 | 14 | 43 (5.5) | | | | |
| 4 | 10-14 | 59 (12.3) | 30 (10.2) | 28 (6.7) | 61 (17.2) | 17 | 11 | 42 | 19 | 17 | 42 | 11 | 19 | 89 (11.5) | | | | |
| 5 | 15-20 | 28 (5.8) | 13 (4.4) | 16 (3.8) | 25 (7.0) | 11 | 5 | 17 | 8 | 11 | 17 | 5 | 8 | 41 (5.3) | | | | |
| 6 | 21-25 | 38 (8.0) | 24 (8.1) | 37 (8.8) | 25 (7.0) | 23 | 14 | 15 | 10 | 23 | 15 | 14 | 10 | 62 (8.0) | | | | |
| 7 | 26-30 | 53 (11.1) | 30 (10.2) | 55 (13.2) | 28 (8.0) | 41 | 14 | 12 | 16 | 41 | 12 | 14 | 16 | 83 (10.7) | | | | |
| 8 | 31-35 | 53 (11.1) | 42 (14.2) | 48 (11.5) | 47 (13.2) | 26 | 22 | 27 | 20 | 26 | 27 | 22 | 20 | 95 (12.3) | | | | |
| 9 | 36-40 | 44 (9.2) | 32 (10.8) | 46 (11.0) | 30 (8.4) | 33 | 13 | 11 | 19 | 33 | 11 | 13 | 19 | 76 (9.8) | | | | |
| 10 | 41-45 | 53 (11.1) | 35 (12.0) | 55 (13.2) | 33 (9.3) | 30 | 25 | 23 | 10 | 30 | 23 | 25 | 10 | 88 (11.4) | | | | |
| 11 | 46-50 | 38 (8.0) | 21 (7.1) | 43 (10.3) | 16 (4.5) | 29 | 14 | 9 | 7 | 29 | 9 | 14 | 7 | 59 (7.6) | | | | |
| 12 | 51-55 | 36 (8.0) | 23 (7.8) | 34 (8.1) | 25 (7.0) | 20 | 14 | 16 | 9 | 20 | 16 | 14 | 9 | 59 (7.6) | | | | |
| 13 | 56-60 | 22 (4.6) | 12 (4.0) | 24 (5.7) | 10 (2.8) | 17 | 7 | 5 | 5 | 17 | 5 | 7 | 5 | 34 (4.4) | | | | |
| 14 | 61+ | 24 (5.0) | 15 (5.5) | 25 (6.0) | 14 (4.0) | 15 | 10 | 9 | 5 | 15 | 9 | 10 | 5 | 39 (5.0) | | | | |
| | Total | 476 (100) | 294 (100) | 416 (100) | 354 (100) | 264 | 152 | 212 | 142 | 264 | 212 | 152 | 142 | 770 (100) | | | | |
| | % | 62 | 38 | 54 | 46 | 34.2 | 19.7 | 27.5 | 18.6 | 34.2 | 27.5 | 19.7 | 18.6 | | | | | |

stages of life may be those infected at an early age. The increasing exposure to the external environment probably enhances the risk of contracting the disease in the early stages of the active life.

Besides this, out of total 770 leprosy cases traced during survey, 62% were males and rest 38% were females. Again the greater exposure of males to the external environment may be a factor in the difference in the distribution among the sexes. Cross examining sex with age and type of cases (as shown in figure 8.15) shows that out of total female cases in most of the age cohorts the number of PB cases exceed the number of MB cases (except in some age groups above the age of 20) Amongst the male groups, PB cases exceed MB upto the age of 20 after which the number of MB cases in all age cohorts are more. This is because, MB cases are less likely to occur in the early years (will be discussed under clinical feature) Similarly if type of cases are cross examined by age and sex than out of the total 770 cases 34.2% were males and 19.7% were females among MB cases, while 27.5% were males and 18.6% were females in PB type of cases as shown in figure 8.16. The number of male cases in each age cohort is

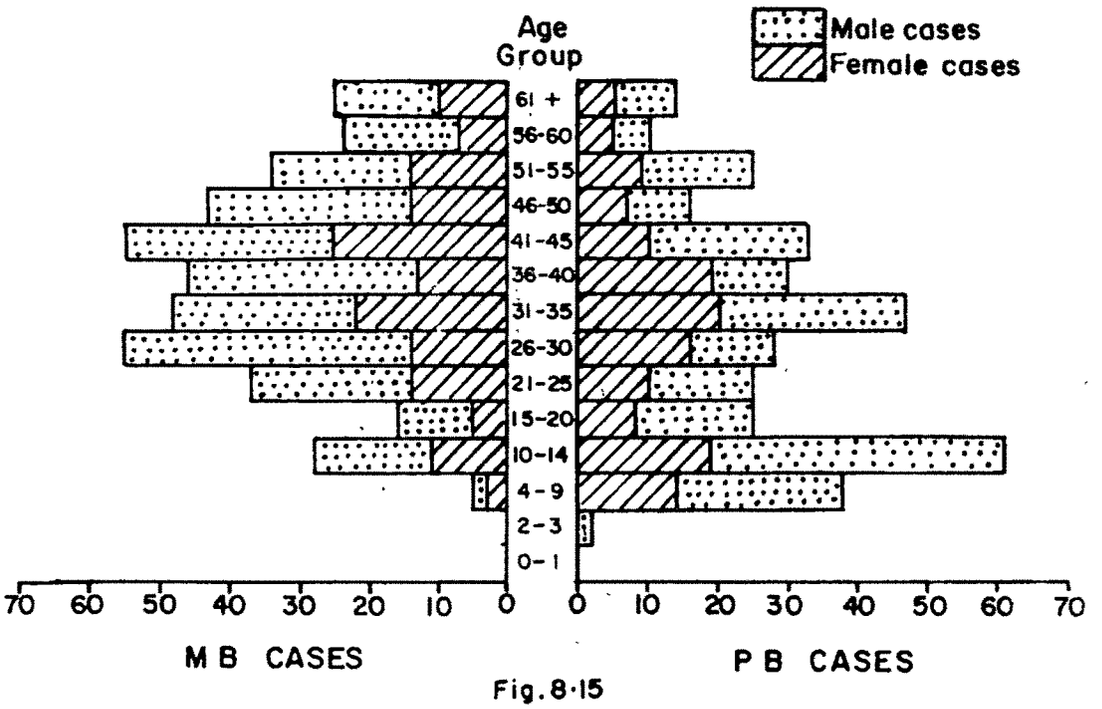



Fig. 8·15

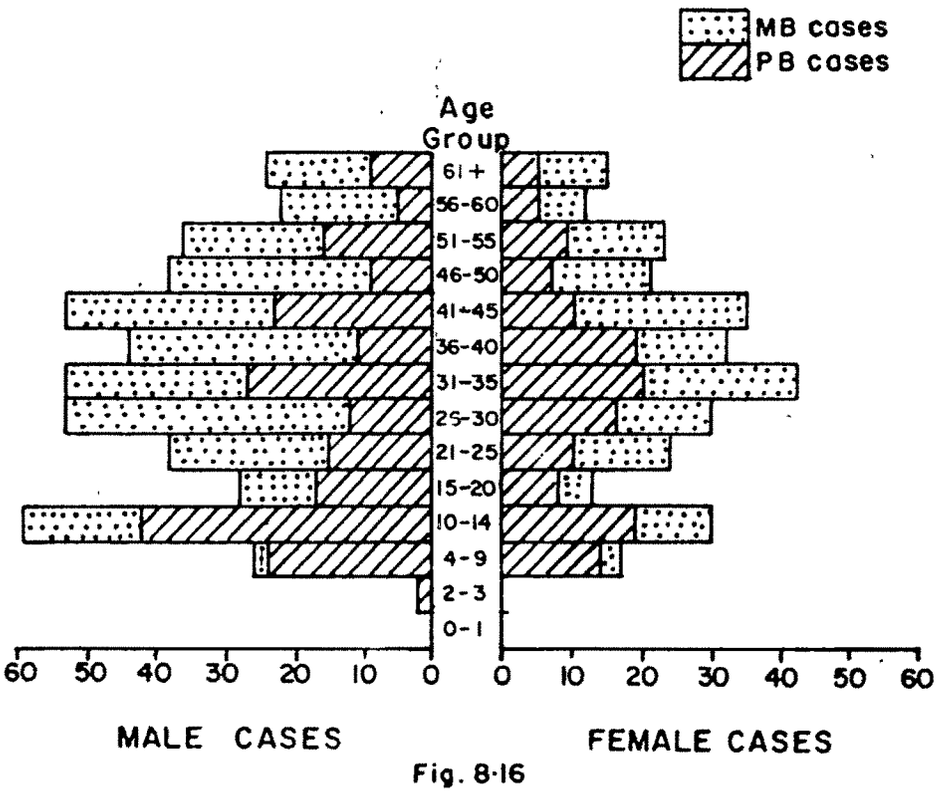



Fig. 8·16

more when compared with female, probably because males experiences more exposure to the external environment which enhances the risk of contracting the disease.

The classification of this cases according to different categories of leprosy and their relationship with age, sex and type of cases is shown in table 8.6. It shows that out of total (770) cases 37.6% are active cases (child + Adult) 57.6% are of RFT cases and 4.8% are relapse cases. Out of the total active cases 52.3% are of MB type and 47.7% are of PB type. Male MB cases constitute 32%, female MB cases are 20.3%,male PB cases are 28.6% and female PB cases comprise 19.1% of the total active cases. The age group of active cases shows that 10-14 (24.1%) and 4-9 (14.1%) had larger number of cases followed by 26-30 (9.6%) and 31-35 (9.3%) in adult active cases. Among this age groups, active child cases (0-14) have more PB cases (PB =86) than MB cases (MB =27) while the reverse is found in active adult cases, whose MB cases are more (MB =125) than PB cases (PB=52).

No child case was found to have relapsed out of 36 relapse cases traced during survey. Among these 36 relapse cases 86% were MB type while the remaining 14% were of PB

Table 8.6 : Association of Age and Sex with infectivity of the cases among child, adult, relapse, and RFT cases

| Sr. No. | Age Group | Active cases (C&A) MB M | MB F | PB M | PB F | Total Active cases (%) | Relapse Cases MB M | MB F | PB M | PB F | Total Relapse Cases (%) | RFT Cases MB M | MB F | PB M | PB F | Total RFT Cases (%) | Grand Total cases (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0-1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 2 | 2-3 | - | - | 2 | - | 2 (1.2) | - | - | - | - | - | - | - | - | - | - | 2 (0.9) |
| 3 | 4-9 | 2 | 3 | 22 | 14 | 41 (14.1) | - | - | - | - | - | - | - | 2 | - | 2 (0.9) | 43 (5.5) |
| 4 | 10-14 | 14 | 8 | 32 | 16 | 70 (24.1) | - | - | - | - | - | 3 | 3 | 10 | 3 | 19 (4.2) | 89 (11.5) |
| 5 | 15-20 | 3 | 2 | 3 | 1 | 9 (3.1) | 2 | 1 | 1 | - | 4 (11.2) | 6 | 2 | 13 | 7 | 28 (6.3) | 41 (5.3) |
| 6 | 21-25 | 9 | 8 | 2 | 2 | 21 (7.2) | 2 | 2 | 2 | - | 6 (16.2) | 12 | 4 | 11 | 8 | 35 (7.8) | 62 (8.0) |
| 7 | 26-30 | 14 | 7 | 3 | 4 | 28 (9.6) | 3 | 1 | - | - | 4 (11.2) | 24 | 6 | 9 | 12 | 51 (11.4) | 83 (10.7) |
| 8 | 31-35 | 9 | 7 | 6 | 5 | 27 (9.3) | 2 | 1 | 1 | - | 4 (11.2) | 15 | 14 | 20 | 15 | 64 (14.4) | 95 (12.3) |
| 9 | 36-40 | 10 | 3 | 2 | 2 | 17 (5.8) | 1 | - | - | 1 | 2 (5.5) | 22 | 10 | 9 | 16 | 57 (12.8) | 76 (9.8) |
| 10 | 41-45 | 7 | 10 | 2 | 1 | 20 (6.8) | - | 1 | - | - | 1 (2.7) | 23 | 14 | 21 | 9 | 67 (15.0) | 88 (11.4) |
| 11 | 46-50 | 7 | 3 | 2 | 1 | 13 (4.4) | 1 | 1 | - | - | 2 (5.5) | 21 | 10 | 7 | 6 | 44 (10.0) | 59 (7.6) |
| 12 | 51-55 | 6 | 2 | 2 | 4 | 14 (4.8) | 5 | 2 | - | - | 7 (19.4) | 9 | 10 | 14 | 5 | 38 (8.5) | 59 (7.6) |
| 13 | 56-60 | 6 | 3 | 2 | 1 | 12 (4.1) | 1 | 1 | - | - | 2 (5.5) | 10 | 3 | 3 | 4 | 20 (4.5) | 34 (4.4) |
| 14 | 61+ | 6 | 3 | 3 | 4 | 16 (5.5) | 3 | 1 | - | - | 4 (11.2) | 6 | 6 | 6 | 1 | 19 (4.2) | 39 (5.0) |
| | Total | 93 | 59 | 83 | 55 | 290 (100) | 20 | 11 | 5 | 1 | 36 (100) | 151 | 82 | 12.5 | 86 | 44 | 770 (100) |
| | % | 32 | 20.3 | 28.6 | 19.1 | 37.6 | 55.5 | 30.5 | 13.8 | 0.2 | 4.8 | 34 | 18.4 | 28.1 | 19.5 | 57 | |

type. Male relapse cases far exceed female relapse, with 55.5% of total relapse cases being MB male, 13.8% are PB male, while the remaining 13.8% are female MB and only 0.2% are female PB cases.

As regards the cases released from treatment (RFT) 52.4% are found in MB type and rest 47.6% are with PB type. So the difference amongst the type was not very significant. Among total MB RFT cases nearly 65% were males and 35% were females. Similarly out of total PB RFT cases 59% were males and rest 41% were females. Among total RFT cases about 5% were children and rest adults. The highest number of RFT cases are found in the age group of 41-45 (15%) followed by 31-35 (14.4%), 36-40 (12.8%), 26-30 (11.4%) and 46-50 (10%).

8.6 Hypothesis : 1

**There is no significant difference in the occurence of leprosy in male and female cases.**

Step 1 : In order to test above hypothesis, "t test" method is used.

$$t_{cal} = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\frac{n_1 s^2 + n_2 s^2}{n_1 + n_2 - 2}\left(\frac{1}{n_1} + \frac{1}{n_2}\right)}} \sim t\,(n_1 + n_2 - 2)\ df$$

Where $S_1^2 = \frac{\sum (X_{1i} - X_1)^2}{n_1}$ (Sample variance of male cases)

$S_2^2 = \frac{\sum (X_{2i} - X_2)^2}{n_2}$ (Sample variance of female cases)

$X_1$ = The Male Sample.

$X_2$ = The Female Sample.

**Step 2** : At level of Significance $\alpha$ = 5%

**Step 3** : Using the figure of vertical column 1 of table 8.5.

$\bar{X}_1 = 36.6$ and $\bar{X}_2 = 24.5$

$S_1^2 = 240.24$ and $S_2^2 = 81.92$

$n_1 = 13$ and $n_2 = 12$

Testing Hypothesis ($H_0$) = There is no difference in the occurence of leprosy in male and female cases.

Alternative Hypothesis ($H_1$) = There is significant difference in the occurence of leprosy cases amongst males and females.

**Step 4 : Critical**

If $t_{cal} > t_{tab}$ Reject the Hypothesis ($H_0$).

$t_{cal} < t_{tab}$ Accept the Hypothesis ($H_0$).

$t_{(13+12-2)}$ = 23 degree of freedom

$t_{(23)\ (0.05)} = 2.067.$

**Step 5 : Calculation**

$$t_{cal} = \frac{36.6 - 24.5}{\sqrt{\frac{13 \times 240.24 + 12 \times 81.92}{12+13}\left(\frac{1}{13} + \frac{1}{12}\right)}}$$

$t_{cal} = 2.26$

**Step 6 : Conclusion**

$t_{cal} = 2.26$ and $t_{tab} = 2.067$

Since $2.26 > 2.067$

ie $t_{cal} > t_{tab}$ Reject the Hypothesis ($H_0$)

It means alternative hypothesis ($H_1$) is true.

Hence the larger number of male cases noted is a highly significant factor and justifies the hypothesis that leprosy is more prevalent among males than among females, because males are exposed more to external environment and most of the part of the body is found to be uncovered.

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