CHAPTER-XV

CHAPTER : XV CONCLUSION

15.1 Major Findings

The major findings of the study regarding the occurrence of leprosy in Vadodara district, may be summed up under the following heads :-

(A) Epidemiological

a) The number of infectious MB cases exceed the number of non-infectious PB cases in this district. On an average, there are 1.3 MB cases to every PB case

b) Relapse cases are more among the PB type cases (80%) than among MB type (20%). Whether this phenomena is related to the current drug regime that is followed, needs to be investigated by the medical authorities.

c) The role of BCG in the control of the disease is not very clear since 53% of the affected cases had taken BCG vaccination. However, it was noted, that among children, the number of MB type cases was negligible among those who were vaccinated with BCG. So it is possible that in the early ages, BCG acts as a protective against the occurrence of the infectious type of the disease, but at later ages, it does not seem to have any effect.

d) Though leprosy cases are found in all age groups, the concentration of the disease is more amongst the youth (26 - 35 years)

and mature (36 - 55 years) age cohorts.

e) Males were found to be more prone to the disease than females probably since the men were found to be more exposed to the external environment than the women, and are less clothed which makes them more vulnerable to bodily contacts.

f) The significance of family contact towards the spread of the disease is not applicable to all types of leprosy cases. Only infectious types of cases in the family can be considered as a source of infection for transmission of the disease. Thus family contact can be considered as a source for contracting of this diseasse if the susceptibility of the contact person and the closeness, frequency and duration of contact is known.

g) No significant difference was found in the occurrence of leprosy cases in nuclear and joint type of families. This further goes to show that it is the infectivity of the case, rather than mere closeness of contact, that is responsible for the transmission of the disease.

h) The population engaged in agriculture were found to be more vulnerable to the disease. Thus, the possibility of getting infection through the soil in which the bacilla can survive for at least 46 days, cannot be ruled out.

i) The significance. of population density towards the spread of

the disease was not apparant as majority of leprosy cases are found to be confined among low to moderate class of population density. Hence, the possibility of spread of the disease is more through population movement (i.e., dynamics of population) from low to high density areas. This is mainly because people afflicted in the rural areas move to the more urbanised and developed areas for treatment or to escape from social ostracism.

j) Although no community is left uninfected by this disease, the occurrence of leprosy cases is maximum amongst schedule tribes.

(B) Environmental factors in the distribution of leprosy

(B1) Physical factors.

a) Location of a region plays a major role in the prevalence and incidence of the disease. In Vadodara district it was found that villages mostly located beside rivers or water bodies had much concentration of the disease.

b) The analysis of soil in such villages reveals that the available water holding capacity of soil was found to be high and sub-surface permeability to be low which in turn permit the soil to become moist. This helps the leprosy bacilla to survive longer and the concentration of leprosy cases was found to be more in such humid micro-climatic zones. Thus, a direct association between humidity and the prevalence rate of leprosy was noted.

(B2) Social Factors

a) Leprosy is still the most stigmatised disease. Therefore, leprosy stigma was a major hurdle in collecting information about the sufferers.

b) Majority of the leprosy cases were found to be belonging to the economic category which is below the poverty line. Their unhygienic living conditions poor quality houses, poor intake of diet are closely linked to this economic status, all of which together contribute to the occurrence of leprosy.

c) Literacy produced different impacts in different age groups. The higher percentage of disease found in school-going children shows the possibility of contracting the infection during close contact with other affected children in the school. In case of adults, the occurrence of the disease was found to be more among the illiterates.

d) Majority of Leprosy cases are detected through survey. The percentage of self-reporting (17%) was insignificant. This highlights three major problems, viz, (i) poor knowledge; (ii) inability to report due to economic reasons and fear of social ostracism; and (iii) lack of health care infrastructure.

e) Lack of knowledge, awareness and perception seemed to be closely related to the prevalence of leprosy.

f) Knowledge regarding the disease starts decreasing away from the district headquarter towards the most remote parts of the district which accounts for the greater occurrence of disease in the less densely populated remote areas.

g) Owing to the stigma attached to leprosy, the onset of the disease gives rise to greater psychological problems. The trauma is enhanced due to lack of knowledge about th disease. The fact that psychological problems are less among those suffering over a prolonged period is due to increasing knowledge with experience and a gradual state of acceptance of facts.

h) The level of stigma can be judged from the study of attitude of sufferers towards the rest of society, as well as by examining the attitude of society towards the sufferers. The study has shown that both, the sufferer who tries to avoid others, and the rest of society which boycotts the sufferer, are equally responsible for perpetuating the stigma attached to the disease.

(B3) <u>Health care</u>

(B3.1) Distribution of health care facilities : The distribution of leprosy control units apperar to be unplanned and haphazard. The eastern talukas of the district such as Chhota Udepur, which have very few cases of leprosy, have large number of leprosy clinics, while the number of such clinics in the high-risk areas

is very few. Also in some cases, the health care centres may be located in contiguous villages while there are vast stretches with no such centres. Thus the accessibility and effective utilisation of the health care facilities are reduced.

(B3.2) **Utilisation :**

a) Nearly 40% of the patients were found negligent towards treatment either because of poor knowledge about the disease, or due to economic reasons.

b) Treatment compliance was about 90% among the cases. Some of the major reasons for compliance included faith in current treatment and availability of free medicine.

c) The Knowledge, awareness and perception (KAP) of the medical and para-medical staff showed poor to average KAP among nearly 51% of the staff. This is probably one of the major factors responsible for the poor diffusion of knowledge among the population particularly in the most remote rural areas.

d) Inadequacy of staff is another feature of the health care system. There were only two physiotherapists and 3 health educators in the entire district. Out of these, one each is stationed at the hospital in Vadodara city and only two are available for the rural areas.

(B4) Diffusion of Leprosy

The diffusion of the disease in the district is predominantly through contact diffusion with either the infected person moving towards the normal person or the normal person moving towards the infected person. The movement is generally haphazard. It was found that in general, every infected case is able to produce at least two new leprosy cases thus the process of diffusion will take place as $2,4,8.....2^n$. On applying NLEP criteria, it was found that 2^n number of total leprosy cases will be able to produce at least 3/2 (2^n) infectious leprosy cases.

The future prediction model that has been derived points out that if the control programme runs smoothly, according to current trend, the emergence of new cases is expected to stop by the end of 2006 - 2007 A.D. Besides this, the expected duration for the number of leprosy cases deducted due to cases released from treatment (RFT) and due to other reasons (died, left and deleted because of other reasons) will be upto the end of 2013 - 2014 A.D. Thus, the deduction of cases will continue for at least seven years after the eradication of new cases. However, acute problems of deformed cases will persist.

15.2 Recommendations

On the basis of the findings the following recommendations are suggested for the more effective implementation of the leprosy eradication programme.

a) Monthly compilation of data regarding the villagewise occurrence of leprosy, and the background information of the sufferers in the format adopted during this study (Appendix 2 & Page 1of 5a) will help to obtain a clearer picture on the characteristics of the disease, and the epidemological and ecological associations, which will further enable identification of endemic areas. Such systematic collection and maintenance of data can be possible by the use of Remote Sensing Technology (RST) and the Geographical Information System (GIS) to store, manage and integrate large amounts of spatially referred data, which can be readily retrieved and displayed through maps.

Apart from GIS and RST another way in which maximum use can be made for disease data is simply a PC based Management Information System (MIS). Here the use of any data base such as DBASE, FOXPRO, ORACAL, SPSS, etc can be used for determining the dominating factors responsible for the incidence of disease. Later these factors can be represented graphically by using packages like LOTUS, HAVARD GRAPHICS etc. Thus it is possible to build up multivariate information system for any disease. A similar system

needs to be urgently applied to leprosy. Such a Leprosy Management System (LMS) can be used to integrate the various approaches for predicting the risk of the disease. When compiled and studied at the macro-level a behavioural model may be prepared that can finally help in the eradication of this dreaded disease.

b) Since the infectious MB cases for exceed the non-infectious types and provide the main source of spread of infection, these are the cases that need to be identified and tackled on a priority basis. Quaratine of such patients might help to prevent further spread of the disease.

c) It has been found that the high risk population includes cultivators, agricultural labourers, the slum dwellers and the healthy contacts living close to the infected persons. Hence, it is this target population that needs to be kept under constant surveillance.

d) In order to protect those engaged in agriculture, wearing of gloves and boots while tilling the soil could be enforced by imparting adequate education by the leprosy workers. In addition, the education programme of NLEP must lay greater stress of the need for cleanliness and personal hygiene in both the rural areas and the urban slums.

e) More efforts must be made in imparting health education,

especially for removing stigma. Thus, each taluka must have atleast one health eduator. Greater initiative needs to be taken in the remote and tribal areas for removing stigma and tackling the problem of deformity.

f) The NLEP should be integrated with skin camps in order to detect more cases.

g) The training of doctors, leprosy supervisors, health educators and physiotherapists must be conducted at regular intervals of time, with a common training programme prepared by experts. More stress needs to be given on differential diagnosis while training the para-medical staff. Apart from this, stress needs to be given on methods of motivation and counselling.

h) As regards the control of non-infectious type cases, strict compliance of the drug regime must be enforced to prevent relapses and possible conversion to the infectious variety.

i) In order to tackle the problem of deformity, the number of positions of physiotherapists must be increased. Each taluka must have at least one physiotherapist or alternatively, there should be one for every 30,000 population in order to tackle the acute problem of deformity noted in the district.

j) While demarcating the area to be covered by a leprosy health worker for cases detection and for providing domicillary treat-

ment, the villagewise analysis of leprosy cases (as already suggested) needs to be taken into account.

k) Reorganisation of the leprosy control units must be done keeping in view the spatial distribution of the prevalence and incidence rates of the disease.

l) The paper work load of each leprosy worker should be reduced in order to enable the worker to devote more time to field work or survey work.

15.3 Future Research Prospects

The present study has indicated the avenues for future research that need to be conducted for a better understanding of the disease problem and its control.

Firstly, more concrete relationship between the occurence of leprosy and various climatic phenomena can be studied at the micro-level during different seasons and at different locations. Data for at least a decade can be collected and analysed, which will help to forecast the areas and the seasons when leprosy is likely to occur. Adequate preventive steps can then be suggested. The use of the Geographical Information system can help to provide more accurate results.

Secondly, types and characterisics of soils and microclimates suited to the survival of bacteria may be investigated

in greater detail in order to identify the high risk areas more conclusively.

Thirdly, how far the factor of nutrition and food habits are related to the occurrence of leprosy, can provide the subject matter for further scientific investigations.

Lastly, similar researches to the present one can be carried out in other parts of the country in order to identify the similarities and disparities in the ecological characteristics and the problems associated with the spread and control of the disease. Viable control measures can only then be implemented on a countrywide or regional basis.

*** THE END ***