



## CHAPTER 5

### RESULTS

This Chapter presents the results of the research in relation to the original objectives, specifically, to identify alternative practices of leprosy patients in seeking leprosy care, to determine costs incurred by patients and their relatives in attending outstation clinics and to determine the potential cost savings for leprosy patients if attending at local clinics. The question of how to determine costs and the implications of potential cost savings on policy options for leprosy care services are considered in Chapter 6.

#### 5.1 Alternative Practices of Leprosy Patients in Seeking Care

By definition, outstation patients may seek care at another health post within their district, travel to a clinic in another district, travel to the regional clinic in their district which is not the nearest health post, travel to a clinic in another Region or travel to the Central clinic.

Analysis of the decisions and options available to patients in seeking care (Section 4.1) has shown a complex network of alternatives. The research has provided some insights into the number of outstation patients travelling to the regional and central clinics (Table 5.1).

Table 5.1 Patients Under Care at Regional and Central Clinic (1993)

| Clinic                       | Regional |       |       |       |       | Central |
|------------------------------|----------|-------|-------|-------|-------|---------|
|                              | j=10     | j=30  | j=39  | j=51  | j=65  | j=30    |
| Clinic District No.          |          |       |       |       |       |         |
| <b>PATIENTS</b>              |          |       |       |       |       |         |
| * Local                      | 2864     | 340   | 106   | 266   | 1196  | 205     |
| %                            | (84)     | (36)  | (67)  | (83)  | (93)  | (33)    |
| * Outstation                 | 528      | 592   | 53    | 53    | 96    | 410     |
| %                            | (16)     | (64)  | (33)  | (17)  | (0.7) | (67)    |
| * Total                      | 3392     | 932   | 159   | 319   | 1292  | 615     |
| %                            | (100)    | (100) | (100) | (100) | (100) | (100)   |
| * Number of feeder districts | 15       | 39    | 8     | 7     | 8     | 37      |
| <b>TRAVEL DISTANCE</b>       |          |       |       |       |       |         |
| * Average/district           | 193      | 326   | 330   | 35    | 146   | 40      |
| * Average /patient           | 112      | 254   | 285   | 72    | 115   | 185     |

However two important questions remain. Firstly, what is the extent of outstation demand within districts and between districts (other than at regional clinics and the central clinic). Secondly, what is the actual pattern of behavior and the determinants of that behavior. These two questions are clearly interdependent.

### 5.1.1 Demand for Leprosy Care

It was argued in Chapter 1 that the causes for seeking care at outstation were thought to be:

- \* social stigma which makes some patients seek diagnosis and treatment where they are not known.
- \* interruption of drug therapy when some feel ashamed to go back and prefer to re register at another clinic.
- \* limited confidence in local personnel and a belief that a Regional/Central clinics will provide more effective service.
- \* where diagnosis is not immediately available on non leprosy days some patients may go to outstation clinics.

These are the factors stimulating demand. But, as suggested earlier, demand will also be constrained by a number of factors.

|           |   |  |
|-----------|---|--|
| $X_j$     | = | the demand for leprosy services at a particular clinic outstation clinic in district j           |
| $n_{ij}$  | = | number of existing cases in district i which is feasible to attend clinic at district j          |
| $ct_{ij}$ | = | total costs to be incurred by patients from district i in receiving care at clinic in district j |
| $r_{ij}$  | = | distance to travel from district i to given clinic in district j                                 |
| $q_{ij}$  | = | geographic feasibility of travel from (i) to given j   |
| d         | = | state of disease of patient  |
| e         | = | fear of exposure (stigma)  |
| $a_t$     | = | attractiveness of other treatment center   |
| l         | = | confidence in local center   |
| t         | = | time feasibility of patients   |
| $X_j$     | = | $f(n_{ij}, ct_{ij}, r_{ij}, q_{ij}, d, e, a_t, l, t)$  |

Among the outstation patients the number travelling from each district is independent of distance to the service clinic. It therefore appears that distance and hence cost is not a primary determinant of their behaviour. However, there are two populations to consider; those who do travel and those who do not. The factors distinguishing these two groups and affecting their behaviour could not be determined with the data and time available for this study.

### 5.1.2 Pattern of Behavior

The decision trees presented in section 4.1 illustrates alternative actions of leprosy patients in seeking diagnosis and treatment. The primary concern of this thesis is the magnitude and components of cost incurred by patients seeking diagnosis and treatment at outstation clinics.

The primary survey was therefore only concerned with costs incurred by a group of sampled patients seeking diagnosis and treatment at each of three clinics at one point in time. No questions were asked of the prior behavior of patients in the consumption of

leprosy care, the patients judgements as to the determinants of that prior behaviors, nor the determinants of the visit to the particular clinic which was recorded.

## 5.2 Costs Incurred by Patients at the Sampled Clinics

The cost data collected through the study sample can be applied at two levels; firstly at the three clinics where the data was collected and secondly, given some assumptions, at all the regional Clinics where information on the number of outstation patients and the travelling distance from feeder districts is known.

### 5.2.1 Costs Incurred by Sampled Patients

The first point to note is the relative magnitude of the cost components for local and outstation patients (Table 5.2)

Table 5.2 Average Cost Components

| PATIENTS     | Cost Components (Average) Rupees |                |                |                   | Total |
|--------------|----------------------------------|----------------|----------------|-------------------|-------|
|              | a <sub>i</sub>                   | b <sub>i</sub> | c <sub>i</sub> | D <sub>i</sub> *W |       |
| LOCAL        |                                  |                |                |                   |       |
| * Costs      | 7.4                              | 10.9           | 0              | 33.2              | 51.1  |
| * % of total | (14.4)                           | (21.2)         | (0)            | (64.4)            | (100) |
|              | a <sub>j</sub>                   | b <sub>j</sub> | c <sub>j</sub> | D <sub>j</sub>    |       |
| OUTSTATION   |                                  |                |                |                   |       |
| * Costs      | 162.1                            | 20.2           | 25.7           | 153.0             | 361.0 |
| * % of total | (44.9)                           | (5.6)          | (7.1)          | (42.4)            | (100) |

Costs can first be compared with average wage rate and income. The per visit cost at the local level is about 75% of the average daily wage rate whereas for outstation patients the cost is 5.3 times the daily wage rate. Assuming 9 visits per year, use of local facilities will cost 2% of annual income and 15% for outstation patients.

The second feature is the magnitude of explicit vs implicit cost. Explicit costs are 208 rupees (58%) for outstation patients but only 18 rupees (35%) for local patients.

### 5.2.2 Costs Incurred at Sampled Clinics

Using the data from the sampled patients, at each of the three sampled clinics, data on the number of outstation patients from feeder districts and the distance to those feeder districts the total costs incurred by all local and outstation patients at the three clinics can be calculated (Table 5.3).

Table 5.3 Total Costs Incurred by All Patients (Rupees) on Three Sample Clinics and Potential Costs Saving

|   | CLINICS        |                |                |                   |
|---|----------------|----------------|----------------|-------------------|
|   | j=10           | j=28           | j=30           | All three clinics |
| LOCAL   |                |                |                |                   |
| $XD_i$  | 2864           | 340            | 205            | 3409              |
| TC <sub>i</sub> (rupees)                      | 1427900        | 149787         | 89390          | 1667168           |
| ATC <sub>i</sub>                              | 499            | 441            | 436            | 489               |
| ATC <sub>iv</sub>                             | 55             | 49             | 48             | 54                |
| RELATIVES                                     |                |                |                |                   |
| RTC <sub>i</sub>                              | 456956         | 47932          | 28605          | 533494            |
| ARTC <sub>i</sub>                             | 160            | 141            | 140            | 157               |
| ARTC <sub>iv</sub>                            | 17.7           | 15.7           | 15.5           | 17.4              |
| TOTAL: PATIENTS & RELATIVES                   |                |                |                |                   |
| TC <sub>i</sub> + RTC <sub>i</sub>            | 1884947        | 197719         | 117995         | 2200661           |
| ATC <sub>i</sub> + ARTC <sub>i</sub>          | 658            | 582            | 576            | 646               |
| ATC <sub>iv</sub> + ARTC <sub>iv</sub>        | 73             | 64.6           | 64.0           | 71.7              |
| OUTSTATION                                    |                |                |                |                   |
| $XR_{ij}$                                     | 528<br>(15.5%) |                | 410<br>(66.6%) | 1530<br>(32%)     |
| $XC_{ij}$                                     |                | 592<br>(63.5%) |                |                   |
| TC <sub>o</sub> (rupees)                      | 927115         | 2007857        | 1908653        | 4843625           |
| ATC <sub>o</sub>                              | 1756           | 3392           | 4655           | 3166              |
| ATC <sub>ov</sub>                             | 195            | 377            | 517            | 352               |
| RELATIVES                                     |                |                |                |                   |
| RTC <sub>o</sub>                              | 492886         | 1096931        | 1062534        | 2652352           |
| ARTC <sub>o</sub>                             | 935            | 1853           | 2592           | 1734              |
| ARTC <sub>ov</sub>                            | 104            | 205.9          | 288            | 193               |
| TOTAL: PATIENTS & RELATIVES                   |                |                |                |                   |
| TC <sub>o</sub> + RTC <sub>o</sub>            | 1420002        | 3104788        | 2971186        | 7495976           |
| ATC <sub>o</sub> + ARTC <sub>o</sub>          | 2689           | 5244           | 7247           | 4900              |
| ATC <sub>ov</sub> + ARTC <sub>ov</sub>        | 299            | 583            | 805            | 544               |
| POTENTIAL COST SAVING: PATIENTS AND RELATIVES |                |                |                |                   |
| * per person/visit                            | 226            | 518            | 741            | 472               |
| * per person/year                             | 2031           | 4663           | 6671           | 4254              |

These costs and cost components should be viewed in relation to three factors. Firstly, total costs per year incurred by all patients ( $TC_1 + TC_2$ ) attending the clinics in relation to the total cost per year incurred by the clinics providing leprosy services (internal vs external costs). Assuming the annual budget for the leprosy Control organization is distributed equally between the 73 districts this would yield a budget of about  $0.9 * 10^6$  Rupees for the three clinics relative to patient and relatives costs of  $9.7 * 10^6$  Rupees. Secondly, for the individual patient in relation to the average daily and annual income. Finally, for the society in respect of the potential costs saving if all patients received services at local clinics ( $6.5 * 10^6$  rupees).

### 5.2.2 Costs at Regional Clinics

Given data on the number of local and outstation patients at all Regional Clinics ( $j = 10, 28, 39, 51$  and  $65$ ) it is possible, making some assumptions, to determine the total costs incurred by patients attending the Regional clinics. The cost at regional clinics can then be compared with the central Clinic. This was part of the initial model.

The assumptions are:

1. Distance travelled by each patient is the average for all patients attending the five regional clinics
2. Total travel cost for patients attending outstation clinics per visit is  $0.92 * \text{average distance travelled}$
3. Other cost components are the average for the outstation and local patients in the small sample.

The costs incurred by all patients attending regional clinics and the central clinic based upon these assumptions are presented in Table 5.4.

Table 5.4 Costs Incurred by All Patients Attending Regional and Central Clinics

|  | CLINICS       |         |          |
|--|---------------|---------|----------|
|  | Five Regional | Central | Total    |
| LOCAL  |               |         |          |
| $XD_i$   | 4637          | 340     | 4977     |
| TC <sub>i</sub> (rupees)                       | 2147163       | 149787  | 2296949  |
| ATC <sub>i</sub>                               | 463           | 441     | 461      |
| ATC <sub>1v</sub>                              | 51            | 49      | 51       |
| RELATIVES                                      |               |         |          |
| RTC <sub>i</sub>                               | 687092        | 47932   | 735024   |
| ARTC <sub>i</sub>                              | 148           | 141     | 148      |
| ARTC <sub>1v</sub>                             | 16.5          | 15.7    | 16.4     |
| TOTAL: PATIENTS & RELATIVES                    |               |         |          |
| TC <sub>i</sub> + RTC <sub>i</sub>             | 2834255       | 197719  | 3031974  |
| ATC <sub>i</sub> + ARTC <sub>i</sub>           | 611           | 582     | 609      |
| ATC <sub>1v</sub> + ARTC <sub>1v</sub>         | 67.5          | 64.6    | 67.7     |
| OUTSTATION                                     |               |         |          |
| $XR_{ij}$                                      | 1427          |         | 2019     |
| $XC_{ij}$                                      |               | 592     |          |
| TC <sub>0</sub> (rupees)                       | 4637697       | 2007857 | 6645464  |
| ATC <sub>0</sub>                               | 3250          | 3392    | 3291     |
| ATC <sub>0v</sub>                              | 361.1         | 377     | 366      |
| RELATIVES                                      |               |         |          |
| RTC <sub>0</sub>                               | 2540692       | 1096931 | 3637623  |
| ARTC <sub>0</sub>                              | 1780          | 1853    | 1802     |
| ARTC <sub>0v</sub>                             | 197.8         | 205.9   | 200.2    |
| TOTAL: PATIENTS & RELATIVES                    |               |         |          |
| TC <sub>0</sub> + RTC <sub>0</sub>             | 7178300       | 3104788 | 10283088 |
| ATC <sub>0</sub> + ARTC <sub>0</sub>           | 5030          | 5244    | 5093     |
| ATC <sub>0v</sub> + ARTC <sub>0v</sub>         | 558.9         | 583     | 566      |
| POTENTIAL COST SAVING : PATIENTS AND RELATIVES |               |         |          |
| * per person/visit                             | 491           | 518     | 498      |
| * per person/year                              | 4419          | 4663    | 4484     |

### 5.3 Potential Costs and Cost Saving at National Level

In attempting to examine possible costs and potential cost saving at the national level an estimate has to be made of the demand and costs incurred by outstation patients at the 67 districts not included in the earlier analysis. These districts provided treatment for 17023 patients in 1993, 77.3 % of the total.

Three scenarios, with different assumptions, can be examined. There are several uncertainties evident in the general demand function. The issues of concern in establishing assumptions relate to the level of outstation patient demand, the average distance travelled because it is directly related to travel costs and the magnitude of the other costs

Firstly, will outpatient demand be larger or smaller (as a percentage) when outstation patients travel within a district or to conveniently located adjacent districts? Outpatient demand for treatment at the Central clinic (63%) and the special mission clinic (66%) may be the maximum percentage perhaps reflecting the pull component in the general demand function. Conversely, when the cost constraint is reduced will outstation increase? Three percentages are therefore considered in the three scenarios, 20%, being similar to the regional clinic ( $j=10$ ), 60%, being similar to the central clinic ( $j=28$ ) and an intermediate percentage of 40%.

Secondly, what will be the average distance travelled by outstation patients? Averages for the central clinic and regional Clinics are 172 km and for the regional clinic ( $j=10$ ), 64 km. While the distance travelled by local patients (defined in the primary survey as travelling within a district) travelled an average of 9 km. The three distances selected are therefore 150 km, 100 km and 50 km.

Finally what cost are appropriate? Travel costs is directly proportional to  $0.92 \times$  distance for outstation patients. The other cost components can be based upon average cost per outstation patient and per local patient per year.

The cost outcomes for the three scenarios are presented in table 5.4. In these costing opportunity cost arising from delay in seeking treatment is not included since this is viewed as a community cost and not a cost incurred by the patient.

Table 5.5 Potential Costs Incurred by Patients at National Level for the Given Scenarios

| Scenario   | Total Annual Costs x 10 <sup>6</sup> Rupees |             |       |                  |
|--|---|-------------|-------|------------------|
|  | Total Outstation patient                    | Total local | Total | Potential saving |
| 1.<br>Outstation patients = 60%<br>Average distance = 150 km<br>Average cost/patient/year = 3032 R. (ATCo) | 40.0  | 4.0         | 44.0  | 33.9             |
| 2.<br>Outstation patients = 40%<br>Average distance = 100 km<br>Average cost/patient/year = 2618 R.        | 23.0  | 6.1         | 29.1  | 18.9             |
| 3.<br>Outstation patients = 20%<br>Average distance = 50 km<br>Average cost/patient/year = 2204 R.         | 9.7   | 8.1         | 17.8  | 7.6              |

Table 5.6 Potential Costs Incurred by Relatives Accompanying Patients at National Level for the Given Scenarios

| Scenario   | Total Annual Costs * 10 <sup>6</sup> Rupees |             |       |                  |
|--|---|-------------|-------|------------------|
|  | Total Outstation patient                    | Total local | Total | Potential saving |
| 1.<br>Outstation patients = 60%<br>Average distance = 150 km<br>Average cost/person/year = 1652 R. (ARTCo) | 21.8  | 1.3         | 23.1  | 19.8             |
| 2.<br>Outstation patients = 40%<br>Average distance = 100 km<br>Average cost/person/year = 1408 R.         | 12.4  | 1.9         | 14.3  | 11.1             |
| 3.<br>Outstation patients = 20%<br>Average distance = 50 km<br>Average cost/person/year = 1164 R.          | 5.1   | 2.6         | 7.7   | 4.5              |