

# AGRICULTURAL MODERNISATION, VALUE OF CHILDREN AND FERTILITY BEHAVIOUR

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The study examines the relationship between agricultural modernisation, costs and benefits of rearing children and fertility behaviour of couples in rural Andhra Pradesh. Indices on economic and non-economic costs, and economic and non-economic benefits were constructed based on scaled responses to attitude statements. Also an index on agricultural modernisation was constructed based on important dimensions of agricultural modernisation. The couples in the backward and developed villages differed significantly in relation to their perception on all the aspects of costs and benefits of rearing children. It was also found that agriculturally more modern respondents scored 'high' on the indices of economic and non-economic costs, and 'low' on the indices of economic and non-economic benefits, and desired to have smaller number of children as compared to agriculturally less modern respondents.

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Agricultural modernisation has attracted considerable attention among social scientists because, India is predominantly a rural economy. Nearly 80 per cent of the population live in rural areas and about 60 per cent of the country's workforce depends on agriculture. Agricultural modernisation leads to rise in income and to better standards of living, which in turn, result in higher levels of schooling, increased age at marriage, more access to health facilities, lower level of infant and child mortality and higher use of contraception. It also leads to rise in educational aspirations, urban contacts, new tastes for modern consumer goods and services, which raise the costs of rearing children while decreasing their value. These finally result in the reduction of fertility. Family, size orientations including achieved family size, ideal family size, desired family size and contraceptive use are dependent on the costs and benefits to parents of rearing children.

Some researchers (Caldwell, 1977; Espenshade, 1977; Nag *et al.*, 1977; Kulkarni, 1979) have approached the problems of costs and benefits from a strictly financial point of view and have calculated the actual costs and benefits of rearing children in their assessment of the economic consequences of fertility. This objectives assessment of economic costs and benefits of children is important since it affects family size decisions and fertility. However, it is of greater importance to examine how and the extent to which parents' perceived economic costs and benefits of children affect their family size decisions.

Besides these, there are non-economic costs, (social, psychological, cultural and so on) and benefits. Parents' perception of the non-economic costs and benefits of children and the extent and ways these perceptions influence family size decisions and fertility are also of importance. Parents' perception of the costs and benefits of children and the value they attach to these costs and benefits constitute their general attitude towards having children. In making decisions on the size of the family, parents may not consciously consider the various costs and benefits, but may be influenced by their attitudes that result from such perceptions. Therefore, the present study attempts to examine the relationship between agricultural modernisation and costs and benefits of rearing children in relation to the desired family size.

## Methodology

Two sets of villages were studied on a comparative basis for the present study. Villages which had witnessed significant agricultural development on introduction of irrigation at

least 15 years back and had taken advantage of irrigation by changing the cropping pattern and by adopting mechanisation were labelled as agriculturally developed villages. Those villages (selected from the same district) which did not have significant irrigation or development through any other means were labelled as agriculturally backward villages.

A total sample of 600 couples in Chittoor district of Andhra Pradesh comprising 300 couples from the developed villages and 300 from the backward villages were studied. The sampling unit for the study was a household having at least one couple with the wife in the reproductive age span of 15-44 years and one or more living children. An interview schedule was used for data collection.

## **Construction of Indices**

### *Indices on Value of Children*

The perception on costs and benefits of rearing children were broadly grouped into four categories namely economic costs, non-economic costs, economic benefits and non-economic benefits, and in each costs and benefits, there were 10 attitudinal statements (Appendix-I).

Perceived economic costs of rearing children were the subjective perception of the parents, their sensitivity and attitude towards the maintenance costs of rearing children. These costs which may induce the parents to perceive their children as a financial burden include saving for children's education, marriage, the costs of child rearing precluding overall other purchases, pre-occupation with child rearing as a cause for not working now, and higher child costs as a cause for taking up employment. Perceived non-economic costs of rearing children were the emotional and physical demands made by children on their parents, noise and disorder in the house, extra housework, general weariness to the mother, lack of time, sleep and worry to the parents and such other costs *i.e.*, the adverse effects of large number of children (4+) on the well-being of a household.

Perceived economic benefits from children were the parents' perception of instrumental assistance and old age security benefits from children. Instrumental assistance refers to help on the farm, business, housework and the child's contribution to the family's finances. Perception of old age security consisted of envisaging the extent to which financial support can be expected from the children and residence with children especially sons in old age. Perceived non-economic benefits from children consisted of intangible factors like their being a source of joy and happiness, a bond between husband and wife, for fulfilment of marriage, for attaining adult status and social prestige and tangible ones like continuity of family name and tradition, producing heirs and performing funeral rites.

It is difficult to measure and interpret variables based on individual perceptions. In order to enhance the explanatory power of attitudinal variables (costs and benefits) a better methodological approach using an index combining all the specific attitudinal statements was adopted. This was considered better as measurement is bound to improve when answers to several related questions are taken into account. Further, the analysis is much easier to carry out when the number of variables is reduced by combining them into indices.

To measure the perceived costs and benefits of rearing children, an index was constructed based on the scaled response to attitude statements reflecting each dimensions of the costs and benefits of children. Each response of the attitude scale on perceived costs and benefits of rearing children was assigned a score value - three for 'agreement', two for 'uncertainty' and one for 'disagreement'. Scoring patterns and scaled response

dimensions used in the index construction for cumulative perceived economic and non-economic costs and economic and non-economic benefits of rearing children were derived from the total sum of scores assigned to the respective costs and benefits of rearing children.

<i>Index</i>	<i>Score Range</i>
Low	10-16
Medium	17-23
High	24-30

#### *Agricultural Modernisation Index*

In order to study the cumulative effect of all the independent agricultural modernisation variables on fertility behaviour an index was developed. This index was based on ten important agricultural modernisation dimensions such as (a) total land holding; (b) source of irrigation; (c) system of irrigation; (d) value of the produce (*rabi* season); (e) value of the produce (*kharif* season); (f) usage of high yielding variety seeds; (g) adoption of plant protection measures; (h) total number of labourers hired; (i) farm assets; and (j) livestock. Based on the composite score (the range values for each of the ten items are given in Appendix-II) assigned to them by giving appropriate weights to their responses, the respondents were stratified as agriculturally 'less modern', 'intermediate' and 'more modern'.

<i>Index</i>	<i>Score Range</i>
Less modern	10-21
Intermediate	22-32
More modern	33-43

## **Results and Discussion**

In India, of the various determinants of fertility, the value of children significantly influences family size preferences. This area of research has attracted considerable attention from demographers because of its role in determining the actual or intended fertility behaviour of couples. As such, the present paper examines the relationship between agricultural modernisation, value of children (economic and non-economic costs, and economic and non-economic benefits) and fertility behaviour.

### **Agricultural Modernisation, Perceived Economic Costs of Rearing Children and Fertility Behaviour**

The relationship between agricultural modernisation and the perceived economic costs of rearing children in relation to the desired family size of the respondents is analysed in Table 1. An inverse relationship between the perceived economic costs of rearing children and fertility may be noticed in all the agricultural modernisation groups conforming the strong negative relationship between the perceived economic costs and fertility on the one hand, and agricultural modernisation and fertility on the other hand.

With increase in the levels of agricultural modernisation, the proportion of respondents who secured high score (24-30) on the index of perceived economic costs also increased and the desired family size declined considerably. This trend may be observed in both sets of villages. Among the respondents who were agriculturally less modernised, significantly more proportion had secured the least score (10-16) with regard to the perceived economic costs of children in both the backward (45 per cent) and developed (46 per cent) villages and desired large number of children (3.72 and 3.40 in backward and developed villages respectively) (Significant at 0.05 level).

Table 1

FERTILITY BEHAVIOUR OF THE RESPONDENTS IN BACKWARD AND DEVELOPED VILLAGES BY AGRICULTURAL MODERNISATION AND PERCEIVED ECONOMIC COSTS OF REARING CHILDREN

Level of agricultural modernisation	Perceived economic costs of rearing children and desired family size							
	Backward villages				Developed villages			
	Low (10-16)	Medium (17-23)	High (24-30)	Total	Low (10-16)	Medium (17-23)	High (24-30)	Total
Less modern (10-21)	3.72 (47)	3.25 (36)	3.14 (21)	3.44 (104)	3.40 (25)	3.10 (20)	3.00 (9)	3.22 (54)
Intermediate (22-32)	3.20 (100)	3.36 (30)	3.00 (26)	3.19 (156)	3.22 (37)	2.91 (46)	2.63 (83)	2.84 (166)
More modern (33-43)	-	3.00 (3)	2.72 (37)	2.75 (40)	-	2.54 (5)	2.35 (75)	2.36 (80)
Total	3.37 (147)	3.28 (69)	2.91 (84)	3.21 (300)	3.29 (62)	2.93 (71)	2.68 (157)	2.78 (300)

In contrast, among those who were agriculturally more modernised, an overwhelming proportion of them secured the highest score (93 per cent and 94 per cent in backward and developed villages respectively) on the index of perceived economic costs of rearing children and desired the least number of children (2.72 and 2.35 in backward and developed villages respectively) (Significant at 0.05 level). Even those who were agriculturally more modernised but secured a medium score (17-23) on this index desired less than three children as compared to agriculturally less modernised respondents.

Several students have reported that parents perceive their children to be making significant economic contribution to the family (Caldwell, 1967, 1977; Arnold *et al.*, 1975; Bulatao, 1975; Buripakdi, 1977). These perceptions of significant economic value were largely concentrated in the rural areas of Asia and Africa among the lower income farmers and agricultural labourers. A number of studies found the economic contributions of children to be significant determinants of fertility (Kasarda, 1971; Cramer, 1975; Liberman, 1976; Cain, 1977; Nag *et al.*, 1977; Aghajanian, 1978; Vlassoff, 1978).

Thus agricultural modernisation changes the attitude of couples towards the costs of rearing children, which in turn, creates awareness among the respondents to desire lesser number of children.

### Agricultural Modernisation, Perceived Non-economic Costs of Rearing Children and Fertility Behaviour

The perception on non-economic costs of rearing children is also higher among the agriculturally more modernised respondents than the less modern. The overall trend showed that as the perception of non-economic costs of rearing children increased, fertility declined in all the three levels of agricultural modernity. The mean desired family size of the respondents in the 'intermediate' and above modernity levels was lower relative to the less modern group (Table 2).

This trend may be observed in both the backward and developed villages.

Table 2

**FERTILITY BEHAVIOUR OF THE RESPONDENTS IN BACKWARD AND DEVELOPED VILLAGES BY AGRICULTURAL MODERNISATION AND PERCEIVED NON-ECONOMIC COSTS OF REARING CHILDREN**

Level of agricultural modernisation	Perceived non-economic costs of rearing children and desired family size							
	Backward villages				Developed villages			
	Low (10-16)	Medium (17-23)	High (24-30)	Total	Low (10-16)	Medium (17-23)	High (24-30)	Total
Less modern (10-21)	3.71 (49)	3.32 (34)	3.00 (21)	3.44 (104)	3.44 (27)	3.10 (19)	2.75 (8)	3.22 (54)
Intermediate (22-32)	3.71 (35)	3.38 (55)	2.74 (66)	3.19 (156)	3.41 (36)	3.00 (47)	2.50 (83)	2.84 (166)
More modern (33-43)	3.00 (1)	2.80 (5)	2.73 (34)	2.75 (40)	3.33 (3)	2.80 (5)	2.29 (72)	2.36 (80)
Total	3.70 (85)	3.33 (94)	2.78 (121)	3.21 (300)	3.42 (66)	3.01 (71)	2.41 (163)	2.78 (300)

Considering the two groups separately, it was observed that the fertility of the respondents with 'intermediates' and above level modernity was lower than those in the less modern group. In addition, the mean desired family size of the respondents who scored 'medium' (17-23) and 'high' (24-30) on the index of perceived non-economic costs of rearing children was lower than those who scored 'low' (10-16). Similar trend was true for respondents in both types of villages. Thus couples who were more modern and had higher perception of the non-economic costs of rearing children opted for lower family size as against those who were less modern and had lower perception of the non-economic costs of rearing children. The findings reveal that differences in perception of non-economic costs of rearing children and agricultural modernisation significantly influence fertility behaviour. These findings are corroborated by the studies conducted in Thailand (Arnold *et al.*, 1975), and Taiwan (Mueller, 1972) which reported an inverse relationship between perceived costs of rearing children and family size. Similarly, Usha Rani (1983) in her study on costs of rearing children and other socio-economic determinants of fertility in rural Andhra Pradesh also reported that the direct and indirect costs of rearing children were associated with a large family size (4+ children).

### **Agricultural Modernisation, Perceived Economic Benefits of Rearing Children and Fertility Behaviour**

Table 3 presents the relationship between agricultural modernisation and perceived economic benefits of rearing children in relation to the desired family size. The findings indicated that the differences in the perceived economic benefits of rearing children significantly influence the fertility behaviour differentially among the respondents with different agricultural modernity levels.

In both the backward and developed villages, with increase in the level of modernisation in agriculture, the proportion of the respondents who scored 'low' (10-16) on the index of perceived economic benefits of rearing children also increased. The low score indicated

Table 3

FERTILITY BEHAVIOUR OF THE RESPONDENTS IN BACKWARD AND DEVELOPED VILLAGES BY AGRICULTURAL MODERNISATION AND PERCEIVED ECONOMIC BENEFITS OF REARING CHILDREN

Level of agricultural modernisation	Perceived economic benefits of rearing children and desired family size							
	Backward villages				Developed villages			
	High (24-30)	Medium (17-23)	Low (10-16)	Total	High (24-30)	Medium (17-23)	Low (10-16)	Total
Less modern (10-21)	3.50 (74)	3.26 (15)	3.33 (15)	3.44 (104)	3.34 (46)	2.60 (5)	2.33 (3)	3.22 (54)
Intermediate (22-32)	3.54 (79)	3.08 (24)	2.74 (53)	3.19 (156)	3.26 (64)	2.78 (33)	2.62 (69)	2.84 (166)
More modern (33-43)	2.81 (11)	2.88 (9)	2.65 (20)	2.75 (40)	3.14 (7)	2.43 (7)	2.27 (66)	2.36 (80)
Total	3.47 (164)	3.10 (48)	2.82 (88)	3.21 (300)	3.28 (117)	2.70 (45)	2.45 (138)	2.78 (300)

that those who were agriculturally more advanced expected less economic benefits from their children which had a decisive influence on the desired family size. More than three-fourths (83 per cent) of the more modern respondents in the developed villages as against one half (50 per cent) of them in the backward villages secured 'low' scores on perceived economic benefits of rearing children. In contrast, the majority of the less modern respondents (71 per cent in backward villages and 85 per cent in developed villages) secured high scores (24-30).

In backward villages, the respondents who were more modern with regard to agriculture and secured 'low' scores on perceived economic benefits from children, desired the lowest number of children (2.65) as compared to those who were agriculturally less modern and secured 'high' scores (3.50 mean desired family size) (Significant at 0.01 level) on the index of perceived economic benefits of rearing children. This trend was more significant in the developed villages and the corresponding figures were 2.27 and 3.34 respectively (Significant at 0.01 level). The observed negative relationship between the perceived economic benefits of rearing children and fertility has been established in a number of studies (Mueller, 1972; Hoffman *et al.*, 1973; Caldwell, 1977; Aghajanian, 1978).

Agricultural modernisation leads to less demand for child labour and reduces the economic benefits of children which directly or indirectly influence the decision on family size couples.

#### Agricultural Modernisation, Perceived Non-economic Benefits of Rearing Children and Fertility Behaviour

Significant differences in the desired family size of the agriculturally less modern and more modern respondents in relation to their perceived non-economic benefits of rearing children may be observed (Table 4). Among the agriculturally less modern respondents, an overwhelming proportion of them secured 'high' scores (24-30) in both backward (89 per cent) and developed villages (96 per cent). In contrast, among the agriculturally more modern respondents, only 48 per cent and 29 per cent secured 'high' scores in the backward and developed villages respectively.

Table 4

FERTILITY BEHAVIOUR OF THE RESPONDENTS IN BACKWARD AND DEVELOPED VILLAGES BY AGRICULTURAL MODERNISATION AND PERCEIVED NONECONOMIC BENEFITS OF REARING CHILDREN

Level of agricultural modernisation	Perceived non-economic benefits of rearing children and desired family size							
	Backward villages				Developed villages			
	High (24-30)	Medium (17-23)	Low (10-16)	Total	High (24-30)	Medium (17-23)	Low (10-16)	Total
Less modern (10-21)	3.43 (93)	3.44 (9)	3.50 (2)	3.44 (104)	3.23 (52)	3.00 (2)	-	3.22 (54)
Intermediate (22-32)	3.35 (117)	2.85 (26)	2.54 (13)	3.19 (156)	3.00 (109)	2.65 (31)	2.42 (26)	2.84 (166)
More modern (33-43)	2.73 (19)	2.82 (13)	2.50 (8)	2.75 (40)	2.60 (23)	2.28 (21)	2.25 (36)	2.36 (80)
Total	3.33 (229)	2.95 (48)	2.60 (23)	3.21 (300)	3.01 (184)	2.51 (54)	2.32 (62)	2.78 (300)

In the backward villages, agriculturally less modern respondents with 'high' scores desired 0.93 children more than the more modern respondents with 'low' scores on the perceived non-economic benefits of rearing children. The findings showed that the perceived non-economic benefits of rearing children also proved to be a vital factor in influencing the desired family size.

When the magnitude of perception on economic and non-economic benefits of rearing children were considered, the non-economic benefits were found to be perceived more by the respondents in both backward and developed villages. Even among the respondents who were agriculturally more modern, a reasonable percentage of them perceived high non-economic benefits of rearing children.

It is evident from the above findings that the economic betterment resulting from agricultural modernisation leads to change in the attitudes of people with regard to value of children, and thereby influences fertility behaviour. Similar findings were reported by Khuda (1988) in a village in the Comilla district of Bangladesh. As a result of agricultural development programmes, the area under mechanisation, fertiliser application, use of pesticides and the cropped area under high yielding varieties increased considerably. It was also observed that the age at marriage and the use of contraceptives were higher and fertility lower in the village than in other parts of the country. Many rural families acquired new tastes for modern consumer durables and the ownership of modern farm implements per household was higher, the level of schooling also increased and all these resulted in decreasing the value of children. Basu *et al.*, (1979) studied the relationship between agricultural development and fertility in rural Gujarat. It was found that the developed villages had a lower cumulative fertility index than the undeveloped villages. They also found that the aspiration level of the benefitted class had gone up significantly leading to a higher perceived cost of children and a lowered desired family size. Arnold and Perjaranonda (1977) reported a more systematic relationship of perceived economic utility and cost of children with fertility behaviour in Thailand. High perceived utility of children was found to be associated with low income farming families. They also found that economic indicators of the perceived utility and cost of children each had a significant net effect in the expected direction on all of the

fertility-related variables. The study by Victor Levy (1985) focused on the direct relation between modernisation and changes in agriculture and the economic contribution of children and its effect on desired family size and fertility. He examined cross sectional evidence on differential fertility in rural Egypt, which indicated that variation in labour contributions from children had an appreciable effect on farmers' attitude towards fertility and actual family size. Since agriculture is the most important and major component of the rural system which influences family size decisions significantly, the emphasis has been on modernising this aspect.

In the rural areas, the cost of rearing children is low and the farmers with large families get a great deal of net benefits from children. Usually children are considered very useful labour at their early ages itself as they directly contribute to the farm output, as well as household maintenance activities. Further, farmers with little land desire to have more sons as a source of security in times of distress or in old age. It is obvious from the above findings that costs and benefits of rearing children, along with agricultural modernisation influence family size decisions.

In order to reduce fertility, it is essential to reduce the actual and perceived benefits from having a large number of children. This may be possible partly through the modernization of agriculture. The mechanisation and introduction of modern technology in agriculture increases the cost of cultivation, as well as decreases the need of child labour. In order to substantiate the increased cost of cultivation, the farmers have to reduce the cost of rearing children which makes them limit their family size. Further, agricultural modernisation increases the production and, thereby, the income, and cuts the economic dependency of the parents on their son(s) during old age. In order to reduce the benefits from children, which is more prevalent in rural areas, the farmers are to be educated by organising block level special training camps and through adult education programmes about the disadvantages of large families, they should also be acquainted with the availability and use of new technologies and improved inputs.

#### Acknowledgement

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#### APPENDIX-I

##### Statements on Perceived Economic Costs of Rearing Children

- (a) Raising children is a heavy financial burden for most people
- (b) The real financial worry about children is education
- (c) Children eat very little but they are still expensive
- (d) Clothing of children is a financial worry
- (e) Housing is a problem when there are many children
- (f) Too many children means too many divisions of property
- (g) Having a lot of children will make their families less well-off
- (h) No worry about daughters' marriages and their dowry
- (i) Having many and frequent pregnancies means increased financial problems later on in life
- (j) Occupational immobility affecting improvement in economic status (present and future)

##### Statements on Perceived Non-economic Costs of Rearing Children

- (a) Many children mean extra work and care
- (b) It is a heavy and tedious job to take care of many children
- (c) Having many children is a great mental strain and loss of sleep
- (d) Having many children means less leisure
- (e) Having many children causes problems and disagreements between wife and husband
- (f) Many children lead to loss of affection between the couple
- (g) Many pregnancies result in deterioration of mother's health
- (h) Too many children lead to lack of privacy (cannot be by yourself)
- (i) Having many children does not permit the wife to have contacts and friendships outside the home and participate in community development activities
- (j) Many children are a restriction on social life (cannot attend marriages, parties, meetings and so on freely)

**Statements on Economic Benefits of Rearing Children**

- (a) Without young children's help men would find it difficult to farm
- (b) Without unmarried daughters' help women would find it difficult to do their housework
- (c) A good reason for having children is that they can help financially when parents are too old to work
- (d) Children provide facilities required for meeting the physical needs and comforts of the parents
- (e) Children inherit family property
- (f) Children are wealth and welfare
- (g) A man with many children has more leisure than a man with few
- (h) The best property a widow can have are children
- (i) More children mean large number of reliable hands to maintain the wealth
- (j) More sons mean more dowries

**Statements on Perceived Non-economic Benefits of Rearing Children**

- (a) Give and take of love and affection
- (b) Enlarge kinship relation
- (c) Continue family line (lineage)
- (d) Perform rituals in the family
- (e) A person with children is respected in the community more than a person without children
- (f) One of the best things about having children is that you are never lonely
- (g) Children perform funeral rites
- (h) Pride in children's accomplishments
- (i) Extension of social relations
- (j) Increase of social prestige through children's status

**APPENDIX-II**

**AGRICULTURAL MODERNISATION INDEX**

<p><b>I Total land holdings</b></p> <p>1 = ≤ 2 acres                  2 = 2-4                  3 = 4-6                  4 = 6+</p>	<p><b>VI Usage of high yielding variety</b></p> <p>1 = Nil                  2 = 25% of total lands                  3 = 25-50% of total lands                  4 = 50% + of total lands</p>								
<p><b>II Source of irrigation</b></p> <p>1 = Tanks                  2 = Wells                  3 = Boring                  4 = Wells &amp; Tanks                  5 = Tanks &amp; Boring                  6 = Wells &amp; Boring                  7 = Wells, Tanks &amp; Boring</p>	<p><b>VII Adoption of plant protection measures</b></p> <p>1 = No                  2 = Yes</p>								
<p><b>III System of irrigation</b></p> <p>1 = Nil                  2 = Kapila                  3 = Oil engine                  4 = Pumpset                  5 = Pumpset, Oil engine &amp; others</p>	<p><b>VIII Total number of labourers hired</b></p> <p>1 = None                  2 = &lt; 200 man days                  3 = 201 - 400 man days                  4 = 401 - 600 man days                  5 = 601 +</p>								
<p><b>IV Value of the produce (rabi season)</b></p> <p>1 = ≤ 3000 (in Rs.)                  2 = 3001-5000                  3 = 5001-10,000                  4 = 10,001 +</p>	<p><b>IX Farm assets</b></p> <p>1 = Nil                  2. = ≤ 5000 (in Rs.)                  3 = 5001 - 10,000                  4 = 10,001 - 15,000                  5 = 15,001 +</p>								
<p><b>V Value of the produce (kharif season)</b></p> <p>1 = Nil                  2 = ≤ 3000 (in Rs.)                  3 = 3001 +</p>	<p><b>X Live stock</b></p> <p>1 = Nil                  2 = ≤ 3000 (in Rs.)                  3 = 3001 - 6000                  4 = 6001 +</p> <p>Minimum = 10                  Maximum = 43</p>								
	<table border="0"> <thead> <tr> <th style="text-align: left;"><i>Index</i></th> <th style="text-align: left;"><i>Range values</i></th> </tr> </thead> <tbody> <tr> <td>Less Modern</td> <td>10-21</td> </tr> <tr> <td>Intermediate</td> <td>22-32</td> </tr> <tr> <td>More modern</td> <td>33-43</td> </tr> </tbody> </table>	<i>Index</i>	<i>Range values</i>	Less Modern	10-21	Intermediate	22-32	More modern	33-43
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# REASONS FOR NEWLY-DIAGNOSED LEPROSY PATIENTS FAILING TO START TREATMENT

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Following the finding that, about 30 per cent of newly-detected leprosy patients in Tamil Nadu failed to start treatment, a sample of 1728 such patients was interviewed intensively by experienced field investigators to elicit the reasons. Lack of knowledge about leprosy - its signs, symptoms and implications - and factors of personal inconvenience - loss of wages, other pressing problems or ailments, the clinic being distant or its timings being unsuitable - were identified as the two broad causes. Corrective measures are discussed.

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An operational assessment of the leprosy control programme in Tamil Nadu, based on a representative sample of 14 randomly selected leprosy control units, identified two major problems (Nair *et al.*, in press). One was that, about 30 per cent of the newly-detected cases did not even register for treatment and the other was that, among those who did, about 60 per cent failed to collect drugs for six months or more in the first year of treatment. A study was, therefore, initiated by us in a subsample of these control units to determine the reasons for (a) non-registration, not so widely known phenomenon, and (b) irregularity in drug collection, which is a chronic problem in all conditions that require long durations of treatment. Although the study was, conducted in close cooperation with the Government of Tamil Nadu, the personnel employed for data collection were not the programme staff but field investigators independently recruited and trained by the Institute for Research in Medical Statistics, Madras. This paper deals exclusively with the reasons for non-registration for treatment.

## Material and Methods

From among the 14 leprosy control units for which an operational assessment of the leprosy control programme was undertaken by Nair *et al.*, six were chosen which had an average of 100 or more unregistered patients per subcentre; each subcentre covered a population ranging from 20,000 to 30,000. From each such Unit, the subcentres previously studied (a random sample) for the operational assessment were chosen for the present study. Within each subcentre, villages with 10 or more leprosy cases and a minimum of two unregistered cases at the time (as per the records maintained by the programme personnel) were identified. A 50 per cent random sample of these villages was then selected, after stratification by distance to the clinic. The objective was to trace and interrogate all the unregistered patients, in each selected village.

Six field investigators with a three year diploma in Rural Sciences from the Gandhigram Institute of Rural Health and Family Planning were employed for this study. All of them had prior practical experience in interviewing villagers. They were initially given a detailed orientation about the leprosy control programme by us for three days, with special emphasis on the sensitive nature of their job. Subsequently, they were given field training for a period of one week, using the proformae designed by us, in consultation with the State Leprosy Officer and other programme administrators.

A team consisting of two statisticians and six field investigators visited each of the six selected control units and from the records listed out the addresses and other details such as age, sex, type of leprosy, date of detection and deformity status of all the unregistered patients in the selected villages. A list consisting of a total of 2394 patients belonging to 319 villages was prepared for interview, and attempts were made to trace these patients. During the field visits, it was discovered that 57 (2.4 per cent) of the patients had died, 146 (6.1 per cent) had permanently left the village, 114 (4.8 per cent) could not be traced and 330 (13.8 per cent) could not be contacted as the house was locked. Of the remaining 1747 patients, 19 could not be interviewed, mainly because they were not cooperative. The remaining 1728 patients were interviewed (in the case of children, who numbered 223, the parent/close relative was interrogated) and data regarding their knowledge about the disease, reasons for failure to register for treatment and their suggestions were recorded. These data form the basis of this report.

## Results

### *Characteristics of the Patients*

Of the 1728 patients, 57 per cent were males; 3 per cent were infectious, 36 per cent non-infectious but had multiple lesions and the rest had a single patch only; 6 per cent of the patients were deformed; 85 per cent of the cases were detected by population survey. About two-thirds of the patients were diagnosed three years before the start of the study, 30 per cent of them were living at a distance of less than two km from the clinic and 47 per cent were living at a distance of five km or more from the clinic; 56 per cent were illiterate.

Of the 1728 cases, 91 per cent were not accustomed to consult or seek advice from others regarding their health problems. Almost all of them (98 per cent) participated in social and other community functions. About half of them (52 per cent) had been advised to take regular treatment, and in 98 per cent of these cases it was the leprosy worker who had given this advice.

### *Knowledge of the Disease*

Over 80 per cent of the patients were unaware of the cause of leprosy; three per cent thought it was due to a poisonous bite, two per cent gave the cause as excessive sex and two per cent said the disease was hereditary. Only four per cent gave bacterial infection as the reason. Knowledge about treatment aspects was equally poor; only 43 per cent believed the leprosy was curable. When asked about the consequences of not taking regular treatment, 62 per cent stated that the disease might become worse, 54 per cent said that deformities might develop and 45 per cent said that the disease might spread to others. These findings indicate the need for effective health education at the community level.

## Reasons for Non-Registration for Treatment

### *Patients who Gave a Single Reason*

Among the 1728 unregistered patients, 1055 (61 per cent) gave a single reason for not registering themselves at the nearby Government Leprosy Control Unit and starting treatment. These reasons, summarised under seven broad groups, are given in Table 1.

Group I accounted for 385 of the patients, namely 36.5 per cent. This group failed to start treatment basically due to the patient's ignorance of the disease or its implications. The

three main reasons for not starting treatment, were 'Disbelief in the diagnosis' (11.9 per cent), 'Belief that the disease had cured spontaneously' (13.6 per cent) and 'Disease causes no inconvenience to daily routine' (9.3 per cent). Special health education to the diagnosed patients could reduce this proportion.

Table 1

## REASONS FOR NON-REGISTRATION, BASED ON 1055 PATIENTS WHO GAVE ONLY ONE REASON

<i>Reason</i>	<i>No.</i>	<i>%</i>
Group I		
a) Disbelief in the diagnosis	126	11.9
b) Belief that the disease has cured spontaneously	<b>143</b>	13.6
c) Disease causes no inconvenience to daily routine	98	9.3
d) Unaware of implications of the disease	9	0.9
e) Not interested in starting treatment	9	0.9
Group II		
a) No faith in the efficacy of treatment	9	0.9
b) Fear of side-effects	15	1.4
c) Fear of injections and drugs	7	0.7
d) No faith in treatment at Government clinics	14	1.3
Group III		
a) Fear of loss of wages	91	8.6
b) No money for bus fare	5	0.5
c) Did not attend due to other ailments	55	5.2
d) More pressing problems	45	4.3
e) No time to attend clinic	13	1.2
f) Out of station	19	1.8
g) Clinic is far away	25	2.4
h) Clinic timings are not suitable	12	1.1
Group IV		
Unaware of clinic location, dates and timings	<b>174</b>	16.5
Group V		
Taking treatment from other sources	<b>140</b>	13.3
GROUP VI		
a) Social stigma	<b>11</b>	1.0
b) Does not like to be treated along side other leprosy patients	<b>11</b>	1.0
Group VII		
Miscellaneous	24	2.3
Total patients	1055	100.0

Misconceptions about treatment resulted in the failure to start treatment in the case 45 patients (43 per cent) in Group II. Corrective strategies and proper motivation could help to overcome problem.

Personal inconvenience was the stated cause for failure to register for treatment in the case of 265 patients, namely 25.1 per cent (Group III). 'Fear of loss of wages' (8.6 per cent), 'Other ailments' (5.2 per cent), 'More pressing problems' (4.3 per cent), and 'Clinic is far

away' (2.4 per cent) were the major reasons in this group. In about 75 per cent of the patients who cited 'Fear of loss of wages' as the reason, the loss would have been less than Rs. 10/- on days they attended the clinic. Among 25 patients who complained that the 'Clinic is far away', 21 were living at a distance of five km or more from the clinic. Flexibility in clinic timings or innovative methods for drug supply may reduce these losses.

Unawareness of the location of the clinic and its date and timings was reported as the reason for not registering for treatment by 174 (16.5 per cent) patients (Group IV). In this context, it may be stated that in the leprosy control programme in the rural areas, road-side clinics are held once a month at prespecified spots, for dispensing drugs to patients. This unawareness could be overcome by improving channels and methods of communication with patients.

It was very revealing that 140 patients (13.3 per cent) who had not registered for treatment at the clinic at the Government Leprosy Control Unit were, in fact, receiving treatment from other sources (Group V). This included 113 (81 per cent) on allopathic treatment, 97 from private practitioners and 16 from other Governmental agencies. Of the 140 patients, 59 stated that they sought treatment outside the programme because they thought that they would receive better care and 19 because they were dissatisfied in general with Governmental health services. Other reasons advanced were that the Government clinic was too far away or had inconvenient timings (18 patients), fear of adverse publicity (9 patients), fear of side-effects (4 patients), and unawareness of the location of the Governmental leprosy centre (9 patients).

Fear of social stigma and unwillingness to queue up with other patients in the leprosy clinic were responsible for non-registration in the case of 22 patients in Group VI (2.1 per cent).

#### *Patients who Gave Multiple Reasons*

There were 673 patients who gave more than one reason for their failure to register for treatment, the average being 2.2 reasons. Considering all 1728 unregistered patients (*i.e.* including the 1055 who gave a single reason), there was a total of 2550 reasons. These are summarised in Table 2.

Excluding the miscellaneous category, the ranking of the six groups by importance is exactly the same in Table 2 as in Table 1, namely, Group I, Group III, Group IV, Group V, Group II and Group VI; the corresponding percentages are also similar, being 35.1 and 36.5, 30.4 and 25.1, 13.6 and 16.5, 10.2 and 13.3, 6.0 and 4.3, and 2.9 and 2.1, respectively.

#### **Suggestions Made by the Patients**

When field investigators enquired of each of the 1728 unregistered patients whether they had any suggestions to make, 1030 (60 per cent) responded, 890 with one suggestion each and the remaining with multiple suggestions. The most common suggestion, made by nearly half the patients, was that the programme should offer to supply the drugs at home, about 25 per cent said that the location, date and timing of the periodic leprosy clinics should be given more publicity, six per cent suggested that financial assistance should be provided for bus fare and compensation for wage loss and four per cent wanted the clinics to be conducted in the village that they lived so that travel time would be minimal.

Of the 698 patients who had no suggestions to offer, 520 simply said that they were not interested in taking treatment, while 90 expressed their intention to commence treatment immediately.

Table 2

## REASONS (SINGLE OR MULTIPLE) FOR NON-REGISTRATION, GIVEN BY TOTAL OF 1728 UNREGISTERED PATIENTS

<i>Reason</i>	Wo.	%
Group I		
a) Disbelief in the diagnosis	210	8.2
b) Belief that the disease has cured spontaneously	254	10.0
c) Disease causes no inconvenience to daily routine	340	13.3
d) Unaware of implications of the disease	39	1.5
e) Not interested in starting treatment	51	2.0
Group II		
a) No faith in the efficacy of treatment	51	2.0
b) Fear of side-effects	39	1.5
c) Fear of injections and drugs	18	0.7
d) No faith in treatment at Government clinics	43	1.7
e) Treatment period is too long	2	0.1
Group III		
a) Fear of loss of wages	193	7.6
b) No money for bus fare	16	0.6
c) Did not attend due to other ailments	153	6.0
d) More pressing problems	137	5.4
e) No time to attend clinic	53	2.1
f) Out of station	55	2.2
g) Clinic is far away	133	5.2
h) Clinic timings are not suitable	36	1.4
Group IV		
Unaware of clinic location, dates and timings	347	13.6
Group V		
Taking treatment from other sources	261	10.2
Group VI		
a) Social stigma	34	1.3
b) Does not like to be treated along side other leprosy patients	40	1.6
Group VII		
Miscellaneous	45	1.8
Total reasons	2550	100.0

## Discussion

Failure of newly diagnosed patients to register for treatment has been identified as a serious problem not only in a representative sample of routine leprosy control units in Tamil Nadu (Nair *et al.*, in press), but also in a specially established Treatment and Study Centre (at Tirukoilur) which had extra inputs (Radhakrishna *et al.*, 1982). These studies also showed that the proportion unregistered was substantially higher in patients detected by door-to-door survey of the population or periodic monitoring of family contacts than in those who reported on their own because of symptoms or signs. It follows that the full benefits

of an active case-finding programme cannot be attained unless the detection is followed by intense efforts to bring all diagnosed cases under treatment. A study of the reasons why patients do not register is therefore of immense interest not only to sociologists but also to programme managers and health administrators.

It is vital to distinguish between excuses that patients may offer for non-registration and real and substantive reasons. This can be accomplished only if the interrogators are well trained and have had previous experience in interviewing rural patients. The present investigation has the advantage that all six investigators employed had a Diploma in Rural Sciences from a premier Institute of Rural Health and Family Planning at Gandhigram and were experienced. Also, the quality of the data collected was monitored by a team of statisticians from this Institute. In consequence, the findings of the study have special significance.

The study reveals that lack of knowledge regarding the disease (symptoms, signs, implications) and factors of personal inconvenience such as loss of wages, other ailments or pressing problems, distant clinics or unsuitable timings are the two broad causes for non-registration. Intensive health education at the community level and improved operational efficiency of the programme (such as proximate clinics, flexible timings, limited financial assistance for, say, bus fare) can net more cases for the treatment programme, and this should be a matter of high priority, especially with the availability nowadays of very efficient multi-drug therapy for leprosy.

It is significant that 13 per cent of the unregistered patients were actually receiving treatment from other sources, mostly private practitioners of allopathy and also, that only one per cent of the patients gave fear of social stigma as the reason for not commencing treatment. This is rather surprising because leprosy continues to be a disease with social ramifications, but we gathered from our discussions with the field staff that, the majority of patients were not clearly aware that what they had was leprosy. We also understood that local programme managers had instructed the Leprosy Inspectors not to explicitly tell patients that they had leprosy for fear of worrying them unduly with the social consequences. Finally, it is unfortunate that as many as 520 (30 per cent) of the unregistered patients stated blandly that they were not interested in commencing treatment, and that they had no suggestions or comments whatsoever about the programme. This group represents a hard core and may need to be tackled more intensively by the programme personnel.

#### Acknowledgement

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