

## **FERTILITY AND FAMILY PLANNING BEHAVIOUR AMONG MUSLIMS: A STUDY IN A VILLAGE IN ANDHRA PRADESH**

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### *ABSTRACT*

*This study was undertaken in a Muslim Community in a village in Andhra Pradesh. Muslim group is considered to be the largest minority community in India. The primary aim of this study was to investigate the validity of widespread rumors and discussions on the acceptance of family planning by the Muslims in India. The investigation dealt, in detail is, the effect of income, education, age at marriage, occupation and residence on family size, fertility and attitude of respondents towards family planning.*

*The study reveals that early marriages are still prevailing in the Muslim community. Most of the young married respondents are in favor of family planning. The literacy level of the Muslim males is significantly influencing the attitude and intention of adoption of family planning. It also reveals that most of the respondents, who are engaged in occupations other than agriculture, i.e. employment and business are showing favorable attitude towards family planning and intend to adopt family planning with three living children. The study suggests the insignificant role of income in influencing the fertility and family planning behavior of the Muslims.*

*The study, in general, explains that Muslims, like other communities in India, are trying to restrict their families and showing favorable attitude towards family planning with fewer children.*

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There has been a tremendous increase in literature on fertility and family planning behavior in the last two decades. Attempts have been made both in India and abroad to develop theories or models on fertility and family planning behaviour<sup>1, 2, 3, and 4</sup>. These have succeeded in pointing out some of the determinants of fertility behavior, still the picture of the whole mechanism which regulates fertility behavior is not clear.

A substantial part of the information on conditions associated with the fertility decline has been drawn from the studies of the demographic transition in western countries. An important cause of the fertility decline was the economic development of these countries. With industrialization and urbanization the functions of the family changed drastically. The emphasis with respect to children was shifted from child-bearing to child-rearing, from the number of children produced to the quality of children raised. Children lost their economic value as factors of production and source of future security. According to Davis, the fertility decline was a consequence of the population pressure resulting from a declining mortality. He maintained that in the societies where income was rising, fear of hunger was not the main motivating factor for individuals to restrict their family size but it is the prospective standing of the family in comparison to other families within its reference group that altered the demographic behavior of the people.

In India, in several studies it was concluded that until the villagers have good assurance that live-born sons and daughters will survive the couples are unlikely to be interested in restricting the numbers of their children<sup>5</sup>.

One of the pioneering and exhaustive studies on population dynamics in India was the Mysore Population Study sponsored by the United Nations. It was found that the economic advantage of children to the parents either in the immediate future or in the old age was the most important reason for having large family. It is also noticed that the motive for having a large or small family size was mainly parent-oriented *i.e.* the motives were the perceived advantages for parents and not for the children. Referring to the caste system, a unique feature of the Indian social structure and occupational structure Mamdani stated that for the

majority of the villagers, large families are not only advantageous but also necessary<sup>4</sup>. For the land owning agricultural caste, children provide the farm labor needed for cultivation. For the landless, the majority of whom are of low caste, children provide the labor for working on rented land and thus, an opportunity to acquire savings. Children of the landless can also immigrate to the city and from there they can regularly send some money to their parents for the eventual purchase of land. A large number of children are an economically unimportant source of labor for only two groups. First, for the few professional and civil servants and second, for the ten per cent of the agricultural caste families.

Crawford and others observed that the perception of the consequences of birth control plays a very important role in the acceptance or rejection of contraception<sup>7</sup>. In their study the perception of the subjects about the relationship of birth control to the attainment and blocking of their values was found to be significantly related to their family planning behaviour and attitudes. Insko *et al.* using a "good-bad" scale on North Carolina women found that women who reported more good points for birth control were also better planners<sup>8</sup>. They also observed that women who scored less on "good-bad" scale were not only dominated by non-users of contraceptives but also had significantly less consistent cognitive structures than users.

In the light of these studies, one can attempt to understand the wide gap between verbal approval and the actual practice of family planning in most of the studies done in India and in other developing countries. It is possible that the perceived good consequences of adopting family planning were outnumbered by the constraints against it. Religious values, fear of complication, opinion of significant others etc. may work as constraints against family planning<sup>9,10,11</sup>. Making a further generalization it can be assumed that the probability of resorting to any action (*i. e.* acceptance of family planning) will vary directly with the strength of expectancy and thereby the action will lead to given consequences (*e.g.* a better standard of living, better education for children etc.) and the value of these consequences to the individual.

The- present article deals with the demographic characteristics

of the Muslim community which is considered to be one of the largest minority communities in India. There are widespread rumors and discussions on the acceptance of family planning by Muslim group in general. In order to investigate the genuineness of such rumors, the present study was undertaken. The investigation dealt in detail the effect of income, education, age at marriage, occupation, and residence of family size, fertility and attitude of respondents towards family planning.

#### ***Objective of the study***

The study objective was to know the effect of different socio-economic and demographic variables on the fertility and family planning behaviour of the Muslims in a rural set up.

#### ***Area of the study***

Fapanaidupet which is the biggest village in Tottambedu taluk, Chittoor district of Andhra Pradesh was chosen as the study area. The village has a population of 3,000 heads. Nearly 25 per cent of the population of this village consists of Muslims and the remaining Hindus. Three-fourths of the village population is engaged in *beedi* manufacturing business which is the main source of their livelihood. And, only a few persons are engaged in agriculture and other service activities. This village is a centre for some of the surrounding villages in this area. As is true of most of the rural areas of India, this village has common characteristics, namely, low status of women, participation of women in manual work and business on a small scale, very poor sanitation and health facilities and pollution.

#### ***Sample Selection***

In the absence of any source to select the sample from the village, the voters' list was considered as a best source. On that basis, the eligible couples among the Muslim religious group in the age group of 15-44 years were chosen and the sample was drawn by using simple random sampling method. The respondents were the male partners of the eligible couples. The total sample of the present study consisted of 50 respondents only.

#### ***Results and Discussion***

*Age at Marriage:* Age at marriage is one of the Important demographic variables which influences the fertility

behavior of the couple. In the present study majority of the respondents were found married in between the age of 15-19 years and only a negligible number of persons got married at the age of 25 years or above. This trend clearly shows the prevalence of early marriages in the Muslim community. The study reveals that the age at marriage is directly related to the fertility behavior and average expected additional family size. It suggests the potentiality of producing more children by the target couples. If proper motivation and mobilization is not provided to the younger population then they will certainly contribute more to the demographic profile. With regard to family planning behavior of the Muslim community, majority of the respondents, irrespective of age at marriage are in favor of family planning. The positive attitude is more in the younger persons who are below the age of 19 years. It is quite interesting to see that most of the young respondents want to adopt family planning with less than three children. In case, the younger persons are properly motivated and convinced about the good results of adoption of family planning, they will certainly use contraceptives. (Tables 1A & IB.)

TABLE 1A  
AGE AT MARRIAGE AND FERTILITY AMONG MUSLIMS

| Sl. No. | Age at marriage | Number of respondents | Total No. of Living Children | Average No. of living children | Total No. of expected additional family size | Average expected additional family size |
|---------|-----------------|-----------------------|------------------------------|--------------------------------|----------------------------------------------|-----------------------------------------|
| 1.      | 14              | 9                     | 18                           | 2.0                            | 33                                           | 2.9                                     |
| 2.      | 15-19           | 30                    | 85                           | 2.8                            | 98                                           | 3.2                                     |
| 3.      | 20+             | 11                    | 34                           | 3.0                            | 43                                           | 4.0                                     |
| Total   |                 | 50                    | 137                          |                                | 174                                          |                                         |

TABLE IB  
AGE AT MARRIAGE AND FAMILY PLANNING AMONG MUSLIMS

| Sl. No. | Age at marriage | Attitude towards <u>family planning</u> |         | Birth order after which family <u>planning will be adopted</u> ____ |              |
|---------|-----------------|-----------------------------------------|---------|---------------------------------------------------------------------|--------------|
|         |                 | Like                                    | Dislike | 1-3rd Child                                                         | 4 + Children |
| 1.      | 14              | 9                                       | -       | 8                                                                   | 1            |
| 2.      | 15-19           | 18                                      | 10      | 15                                                                  | 15           |
| 3.      | 20+             | 8                                       | 5       | 9                                                                   | 2            |
| Total   |                 | 35                                      | 15      | 32                                                                  | 18           |

*Education:* The success of the family planning depends mainly on the literacy level of the people. If more people are literate, more people will adopt family planning and thereby reduce the growth of population. Tables 2A and B show the relationship between education, fertility and family planning. Most of the respondents in the sample area are literates. It reveals that the literate Muslim males are having more children and expecting additional family size compared to the illiterate Muslim males. With regard to attitude towards family planning, more proportion of the respondents in general is favorable to family planning. Significantly, however, more people in the literate category are in favor of family planning compared to illiterates. Irrespective of education, greater proportion of the respondents intends to adopt family planning with three living children. The study reveals the importance of education towards favorable attitude and future adoption of family planning in the sample area. This study also suggests the promotion of education in rural areas to enhance family planning acceptance.

TABLE 2A

EDUCATION AND FERTILITY AMONG MUSLIMS

| SI. No. | Educational categories (Males) | Number of respondents | Total No. of living children | Average No. of living children | Total No. of expected additional family size | Average expected additional family size |
|---------|--------------------------------|-----------------------|------------------------------|--------------------------------|----------------------------------------------|-----------------------------------------|
| 1.      | Literates                      | 31                    | 90                           | 3.0                            | 117                                          | 3.8                                     |
| 2.      | Illiterates                    | 19                    | 47                           | 2.5                            | 57                                           | 3.0                                     |
|         | Total                          | 50                    | 137                          |                                | 174                                          |                                         |

TABLE 2B

EDUCATION AND FAMILY PLANNING AMONG MUSLIMS

| SI. No. | Educational categories (Males) | Attitude towards family planning |         | Birth order after which family planning will be adopted |              |
|---------|--------------------------------|----------------------------------|---------|---------------------------------------------------------|--------------|
|         |                                | Like                             | Dislike | 1-3rd Child                                             | 4 + Children |
| 1.      | Literates                      | 26                               | 5       | 16                                                      | 15           |
| 2.      | Illiterates                    | 9                                | 10      | 16                                                      | 3            |
|         | Total                          | 35                               | 15      | 32                                                      | 18           |

*Occupation:* It is a common fact that the occupation of the individual determines his position in the society and standard of living. Tables 3A and B reveal the occupational structure of the sample population. Most of the respondents in the sample are doing business and are in employment. Only a few persons are Involved in agriculture. Majority of the respondents from the employment and business categories show higher fertility and higher additional expected family size compared to the cultivators in the sample population. It also suggests the importance of occupation with regard to favorable attitude to family planning. Most of the respondents who are engaged in business and employment show favorable attitude towards family planning when compared to those persons who are involved in cultivation. With regard to the Intention of adoption of family planning, more people are interested to adopt family planning with three living children. Here, the study reveals the importance of non-traditional occupation i.e. other than agriculture which is directly related to the attitude and future practice of family planning.

TABLE 3A  
OCCUPATION AND FERTILITY AMONG MUSLIMS

| SI. No. | Occupational categories       | Number of respondents | Total No. of living children | Average of No. of living children | Total No. expected additional family size | Average expected additional family size |
|---------|-------------------------------|-----------------------|------------------------------|-----------------------------------|-------------------------------------------|-----------------------------------------|
| 1.      | Employees and business people | 42                    | 121                          | 3                                 | 151                                       | 3.6                                     |
| 2.      | Cultivators                   | 8                     | 16                           | 2                                 | 23                                        | 3.8                                     |
| Total   |                               | 50                    | 137                          |                                   | 174                                       |                                         |

TABLE 3B  
OCCUPATION AND FAMILY PLANNING AMONG MUSLIMS

| SI. No. | Occupational categories       | Attitude towards family planning |         | Birth order after which family planning will be adopted |              |
|---------|-------------------------------|----------------------------------|---------|---------------------------------------------------------|--------------|
|         |                               | Like                             | Dislike | 1-3rd Child                                             | 4 + Children |
| 1.      | Employees and Business people | 28                               | 14      | 25                                                      | 17           |
| 2.      | Cultivators                   | 7                                | 1       | 7                                                       | 1            |
| Total   |                               | 35                               | 15      | 32                                                      | 18           |

*Income:* The family cannot survive without sufficient income to maintain it. Hence, income is the basis for all activities of the family. The status of the family in the society is determined primarily based on the income of the family. As shown in tables 4A and B, majority of the respondents fall in the low income category of less than Rs.500 per month and only a few persons earn a monthly income of more than Rs.500. The income of the family of the sample population does not significantly influence the fertility performance as well as additional expected family size. Most of the respondents in the low income category are in favor of family planning. Significantly, more proportion of the respondents in the lower income category show favorable attitude towards family planning compared to the negative attitude. Majority of the respondents in the low income category want to adopt family planning with only three

TABLE 4A  
INCOME AND FERTILITY AMONG MUSLIMS

| SI. No. | Monthly Income of the family | Number of respondents | Total No. of living children | Average No. of living children | Total No. of expected additional family size | Average expected additional family size |
|---------|------------------------------|-----------------------|------------------------------|--------------------------------|----------------------------------------------|-----------------------------------------|
| 1.      | Low Income (Below Rs.500)    | 42                    | 117                          | 2.8                            | 149                                          | 3.5                                     |
| 2.      | High Income (Above Rs.500)   | 8                     | 20                           | 2.5                            | 25                                           | 3.1                                     |
| Total   |                              | 50                    | 137                          |                                | 174                                          |                                         |

TABLE 4B  
INCOME AND FAMILY PLANNING AMONG MUSLIMS

| SI. No. | Monthly Income of the family | Attitude towards <u>family planning</u> |         | Birth order after which family <u>planning will be adopted</u> — |              |
|---------|------------------------------|-----------------------------------------|---------|------------------------------------------------------------------|--------------|
|         |                              | Like                                    | Dislike | 1-3rd Child                                                      | 4 + Children |
| 1.      | Low Income (Below Rs.500)    | 31                                      | 11      | 29                                                               | 13           |
| 2.      | High Income (Above Rs.500)   | 4                                       | 4       | 3                                                                | 5            |
| Total   |                              | 35                                      | 15      | 32                                                               | 18           |



living children compared to the high income group. This study clearly reveals the Insignificant role of the income in influencing the fertility and family planning behavior of the Muslim community in the sample area.

*Residence:* The residence is also one of the important variables which determine the behavior of the individual. Rural people have distinct social, cultural and economic background. They are illiterate and religious minded. The main occupation of the rural people is agriculture. Joint families are properly found in rural India. This is entirely different from urban India. Urban people are rational in their thinking. They are free and active in their daily life. It is, therefore, observed that there are wide differences between rural and urban people in India. In the tables 5A and B, the average number of children a couple have is 2.86 and the average expected additional family size is around 3.5. With regard to the attitude towards family planning, more people are in favor of family planning and majority of the respondents intend to adopt family planning with three living children. This study reveals that residence does not significantly influence the fertility and family planning acceptance of the Muslim community.

TABLE 5A  
RESIDENCE AND FERTILITY AMONG MUSLIMS

| SI. No. | Residence | Total Number of respondents | Average No. of living children | Average expected additional family size |
|---------|-----------|-----------------------------|--------------------------------|-----------------------------------------|
| 1.      | Rural     | 50                          | 2,86                           | 3.5                                     |

TABLE 5B  
RESIDENCE AND FAMILY PLANNING AMONG MUSLIMS

| SI. No. | Residence | <u>Attitude towards family planning</u> |         | <u>Birth order after which family planning will be adopted</u> |              |
|---------|-----------|-----------------------------------------|---------|----------------------------------------------------------------|--------------|
|         |           | Like                                    | Dislike | 1-3rd Child                                                    | 4 + Children |
| 1.      | Rural     | 35                                      | 15      | 32                                                             | 18           |

### ***Summary and Conclusions***

The study shows that it is a common practice among Muslim religious group to marry early. But this village based study shows low fertility for Muslims compared to the other regions of India 12, 13. More people are in favor of family planning, especially the younger respondents.

Most of the respondents in the sample population are literates, hence Intelligent in their thinking and behavior. More Muslim literates show favorable attitude towards family planning. Irrespective of birth order, most of the respondents in the literate category want to adopt family planning compared to the illiterate population. Literacy is thus significantly influencing attitude towards family planning and intention of adoption of family planning.

The main occupation of the sample population is *beedi* manufacturing, a small-scale Industry. Most respondents who are engaged in non-traditional occupations like business and employment show a favorable attitude towards family planning and intend to adopt family planning with three living children.

Majority of the respondents in the sample area are business people.. The average income of a Muslim family is Rs.400 per month. They are neither rich nor poor. One distinct finding is that income does not significantly influence fertility and family planning behavior of the Muslims in the sample area.

The study, in general, reveals that Muslims like other communities in India are trying to restrict their families and showing favorable attitude towards family planning with fewer children. Even though the Muslims in the study area are rural they are having certain qualities which can be termed as urbanized.

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## **FRAMEWORK FOR SYSTEMATIC ANALYSIS OF ALTERNATIVE APPROACHES TO TUBERCULOSIS CONTROL PROGRAMME**

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### *ABSTRACT*

*The various TB surveys conducted in the country reveal that nearly 1.8 to 2 per cent of the population is suffering from active pulmonary tuberculosis and nearly one-fourth of these are sputum positive. Therefore, it is estimated that there will be nearly 8 million active TB cases, of which 2 million would be infectious. It is further estimated there will be at least 5,00,000 deaths per year due to TB. The Government of India, though constrained with the paucity of resources, is committed to control the disease within the shortest possible time.*

*Given the case finding operations on a sporadic scale would identify those suffering from TB, this paper purports to construct a framework for systematic analysis of three alternative approaches to reduce and resolve the problem.*

Broadly speaking, control of TB comprises of (a) cure of the existing patients; and (b) immunization of the susceptible population which is under technological uncertainties or prophylactic treatment. Hence, the objectives of the programmes under analysis are as follows:

- i. to provide treatment facilities to all the active cases of TB;
- ii. to ensure cure of all patients; and
- iii. to effectively check and control the transmission of the disease within a period of twelve years by both

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treatment of the positive cases as well as immunization and or prophylactic treatment of the susceptible population especially the age-group under 20 years.

### ***Programme Alternatives***

Three programme alternatives are considered for analysis.

Programme A: Hospital based treatment both as inpatients and out-patients.

Programme B: Domiciliary treatment through para-medical personnel (with no increase in hospital beds for TB - the existing ones used only for chronic and complicated cases).

Programme C: Domiciliary treatment through Indigenous Medical Practitioners and or Community Health Volunteers with the present health care delivery system.

*Programme A:* Under this programme, the total number of beds in the existing hospitals in the district and taluk are to be increased to 40,000 earmarked for the TB patients. Taking six months as the average duration of treatment to make the sputum positive cases to sputum negative cases, 80,000 patients can be given treatment in the hospitals in a year. Ten per cent of the cases that are diagnosed as open cases will be hospitalized and treated as in-patients. The remaining will receive treatment as out-patients.

The time required to achieve the objective through this programme is thus  
$$\frac{8,000,000 \text{ (Total cases)} \times 10}{100 \times 80,000} = 10 \text{ years.}$$

As it will take nearly two years to set the programme into operation and a small percentage of population already under treatment, it is reasonable to fix the target period as twelve years.

*Programme B:* Under, this programme, no more beds for TB cases are to be added and the existing beds could be used for chronic cases. Additional facilities such as X-Ray machines and laboratory facilities for sputum examination will have to be provided in the Primary Health Centers.

In addition to the other staff, five Lady Health Visitors at the rate of one for every 20,000 population are provided in the Primary Health Centres under the Multipurpose Health Workers' Scheme. They will be responsible for the domiciliary treatment of TB cases after being diagnosed by the PHC Doctors. The number of patients per LHV will be about 360. Required visit per patient per week for effective follow-up being taken as three, a LHV can cover 18 patients a week with nine visits a day to the TB patients in the village. Taking six months as the average treatment period for the conversion of sputum positive cases, the time required to achieve the objectives through this programme is:

$$\frac{360}{18} \times \frac{6}{12} = 10 \text{ years}$$

Making adjustments to patients ready under treatment and the availability of an infracts already available except the addition of the staff and installation of equipments, it is expected that the objectives of the programme are attainable within ten years through this alternative.

It should be noted that the assumption of 'stationary of situation' maintained through deaths of old cases and incidence of new cases is implied in all the three programmes discussed.

*Programme C:* Without any addition to the existing staff, the responsibility of providing domiciliary treatment, after diagnosis by the PHC Doctors, will be vested with the Indigenous Medical Practitioners who are available in the villages. The services of these people are recognized, accepted and approached by the rural population. They should be oriented to the domiciliary treatment for TB and incentives may be provided based on performance. This may further strengthen the Community Health Volunteers Scheme.

One such practitioner will be selected for every village and they will be supervised or followed-up by the health workers, health supervisors and medical officers.

This programme may sound unconventional and may be resisted by the members of the health care system. This kind of an approach, though unconventional, is recommended by the Joint Committee of the WHO/UNICEF as follows: "Different

types of Indigenous healers may be trained and integrated into 'the general health system. The possibility of having some form of integration of these into the existing health systems should be investigated further".

The time required for achieving the programme objectives under this alternative and the infrastructure support will be same as that of programme 'B\*.

### ***Criterion***

In this given problem, there is a strong social commitment to save human lives, to treat and cure all patients and check the transmission of the disease. Moreover, the benefits of this programme are difficult to be measured in \$ values due to the difficulty of working out the work days lost as there is a widespread unemployment and under-employment of the rural population. What we are vitally interested in is to minimize the value of resources used (costs) to attain the stated objectives. Therefore, the technique to be adopted to compare and evaluate the three alternatives should be *cost-effectiveness analysis*. The preferred decision rule may be:

- i. Maximize output, number of patients treated and cured, lives saved for a given total cost (budget constraint) or
- ii. Minimize cost for a given level of output.

The programmes have been so designed as to obtain the objective - 'Tuberculosis Control<sup>1</sup> - within ten to 12 years, given that the programme is effectively implemented in terms of the objectives-attainment as planned, benefits accruing from them are approximately equal, subject to the following qualifications:

- a. The rates of cure are equal in all the three approaches and in fact, they are, provided supervision adequate enough to ensure regular intake of drugs.
- b. Intangibles such as satisfaction of patients treated at home and hospital, creating awareness, removing misconceptions etc., are not significantly different between the programmes.



- c. Value of time differentials in saving human lives within ten to 12 years is not significantly different in respect of the programmes. These differentials can also be taken into account, giving higher value to saving of life at earlier point of time by simple discounting.

### ***Sensitivity Analysis***

It is also possible to make a sensitivity analysis with degree of supervision as critical variable (in programmes B & C) on which depends the cure rate and check of transmission rate. It is assumed above that the supervision envisaged in programmes<sup>A</sup> B & C is so adequate and effective that the cure rates are equal under the two programmes. Now, taking supervision as variable (80% effective or 90% effective in comparison with hospital treatment standard), we can find out the number of patients treated and cured under B & C and compare A, B & C in terms of output (patients<sup>A</sup> treated, cured, and lives- saved), Sensitivity analysis can also Be made with different discount rates.

### ***Benefits and Costs***

Benefits to be considered are:

- i. Number of patients treated and cured.
- ii. Effective check on the transmission of disease, lowered sputum positive cases.
- iii. Satisfaction of patients and others in the family arising from recovery and enjoyment of healthy life and productivity.

For (i) above, the data will be available from the monthly reports of the programmes. The same is true for (ii) and from the laboratory records and will be confined to sputum positive cases only, (iii) *Inter alia* is a function of (a) and (b). All these benefits are very difficult to measure in terms of money, but from the monthly reports of the programmes we can have the stream of benefits in terms of numbers of patients treated and cured (assumed equivalent to the number of lives saved).

### *Costs*

Costs to be considered are:

- i. Programme expenditure - budgeted amount (capital and operation).
- ii. Opportunity costs - value of the opportunities foregone due to utilization of resources in this programme or the cost of the best available alternative.
- iii. Associated costs - any costs in terms of the time spent provided by system and in utilizing programme services by beneficiaries. This cost is borne by the beneficiaries but adjusted to the total costs in (i) above and are the expended amount both capital, receiving discount rate etc., by available from the financial statements and monthly and annual reports of the organization, (ii) opportunity costs of the programmes should be worked out against the cost of the best available alternative or investment on a non-health programme and the returns thereto. It could also be reflected in properly chosen social discount rates which will be only of academic interest as the Government will spend that amount in any case due to political considerations, (iii) associated costs comprise in expenditures incurred by \$ and time spent by the beneficiaries • in order to avail of the services provided by the programmes. Though it is difficult to calculate all the associated costs in terms of money it is quite possible to make an approximate estimate - especially an estimated ratio. However, this may be kept outside the analysis in the first Instance (not ignored, but unincorporated in the cost stream) for the sake of simplicity.

Now, the time stream of costs is calculated and the present value thereof on the basis of social discount rate can be assessed as follows:

$$\text{Where } C_d - \text{Total discounted cost} \quad C_d = \sum \frac{C_t + E_{t1}}{(1 + r)^t}$$

$C_i$  = Costs (capital & operation) in the  $i$  th year

$C_{ii}$  = Opportunity cost

$i$  = 0, 1, ..... 10 (in this case)

$r$  = Discount rate

The correct social discount rate should be the weighted average (adjusted for externalities) of the rates of return of different sectors, weight being the proportion of resources drawn from those sectors.

The cost per unit output ( $= \frac{C_d}{\text{\#of lives saved}}$ ) will show the programme's worth. The obvious choice should be one which is less costly, however radical it is.

### ***Quantification of Benefits***

Weisbrod has calculated costs of premature death and disability due to tuberculosis on the basis of the average wage minus consumption. Malen Baum's observation that sickness lowers productivity even in the face of pervasive unemployment and labor surplus is yet to be substantiated and specified in precise terms. The method of 'willingness to pay off beneficiaries' is not very much applicable due to very high percentage of illiteracy and lack of health consciousness in our country.

Therefore, a rough approximation of economic value of lives saved can be computed by the formula:  $v = y \times t \times n$  Where

$V$  = Value in Rs.

$Y$  = Number of years lived by the patients  
after recovery minus consumptions.

$N$  = Number of patients cured and rehabilitated.

$T$  = Can be calculated from a cohort of cured patients.

"Decreased productivity" and higher ages of TB patients can be assumed to be mutually counter balancing so far as

income is concerned and hence per capita income seems a reasonable approximation.

The benefit (ii) can be roughly computed on the basis of infection rate by sputum positive cases to the healthy hosts - it is estimated that a sputum positive case, when at large can infect nine persons a year. Making an adjustment for 'overlapping' and 'induced immunization'<sup>1</sup>, it is possible to estimate the benefits of cure of a sputum positive case in monetary terms. The benefit (iii) is not amenable to quantified measurement except by assigning subjective values. Once we quantify and express benefits in rupee values, it is easy to compute the present value of the benefit stream by the following formula:

$$B_D = \sum \frac{B_t}{(1 + r)^t}$$

In such a case net gain (=  $B_D - C_D$ ) will show the worth of the programme. The programme whose net gain is highest should be preferred.

### ***Other Aspects***

In these programmes there is also an indirect income-distributional consequences in that (i) the vast majority of the patients are in the lower economic stratum of the society and the programmes 'B' increases trained manpower utilization and programme 'C' provides practical problems of patients accessibility for cure and care. B & C seems more equitable in this respect because they provide dispersed facilities for the patients with less associated costs and better utilization of community resources.

The second important aspect is the motivational impact. Programme 'C' is likely to create more awareness among the people of the tuberculosis menace and likely to be more effective as the Community Health Volunteers and indigenous medical practitioners have a better feel of the problems with the community wherein they live. Thus it will help increase and consolidate community participation to other health programmes also.

## AN ANALYTICAL MODEL OF HUMAN FERTILITY WITH PROVE3IO\_N FOR ADOLESCENT STERILITY

K. B. Pathak\* and R. N. Pandey

### ABSTRACT

A probability model has been developed to describe the distribution of intervals between births or the waiting time until  $r$ th birth of women who are married at early ages. In deriving the expressions, provisions are made for foetal wastages and non-susceptible periods following pregnancy, the duration of which depends on the pregnancy outcome. The first four factorial moments of the distribution of waiting time for  $r$ th birth are also obtained. To judge the validity of the model, it is applied to the data of Singh related to the waiting time of first birth from marriage.

Study of the extent of adolescent sterility at various ages is of immense interest, not only for the biologists but also for the demographers who are involved in fertility studies. In countries, like India, where age at effective-marriage for females is quite low, that is, most of the marriages are consummated under age 20, the prevalence of adolescent sterility is quite common. A detailed study of fertility in adolescence is given in the book edited by Parkes *et al*<sup>1</sup>. Talwar determined the extent of adolescent sterility at ages below 19 by subtracting the proportion of women conceiving within a year from the date of marriage from the similar proportion for the women marrying at age 19 or so<sup>2</sup>.

On account of biological phenomena fertility behavior of a woman who marries in her adolescent age becomes quite different from that of a woman who marries at the latter age. Therefore, probability distribution for waiting times up to 1st, 2nd, .....  $r$ th birth or number of births during a

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given time period  $(0, t)$  need some modifications. Extending the work of Pathak we propose a discrete time model which describes the distribution of intervals between births or the waiting time until the  $r$ th birth in case of those women who marry in their adolescent ages<sup>3</sup>. Specific results have been obtained by making provisions for inclusion of foetal wastage and non-susceptible period following pregnancy, the duration of which depends on the pregnancy outcome. Inclusion of foetal wastages brings the model of Pathak closer to reality. The estimates of fecund ability and adolescent sterility seem to be biased downward and upward respectively if the foetal losses are not considered. Since the data is not available on waiting times for higher order births, the model proposed here is applied to the data on the time of first birth given by Singh for the sake of illustration only<sup>4</sup>.

### ***The Model***

The model derived here is based on the following assumptions:

A<sub>1</sub>: The cohort of women consists of two homogeneous groups, first group constitutes of those women who are biologically mature at the time of their effective marriage and hence are exposed to the risk of conception, and the second group constitutes of those women who are not biologically mature at the time of their effective marriage but are exposed to the risk of ovulation. Let  $\alpha$ , and  $(1 - \alpha)$  respectively be their proportions.

A<sub>2</sub>: During any menstrual cycle, which is assumed to be equal to one month (treated as unit of time here), when a woman is susceptible to conception, the probability of conception is equal to  $\alpha$  and is assumed to be constant during the period of observation.

A<sub>3</sub>: There is a fixed probability  $\theta$  that any pregnancy will end in a foetal loss (miscarriage, abortion or still birth).

A<sub>4</sub>: A pregnancy which terminates in a live birth (L-conception) is associated with a temporary non-susceptible period of  $(m-1)$  months after the month of conception and a pregnancy that terminates in a foetal loss is associated with similar infecundable period of  $(w-1)$  months.

A<sub>5</sub>: During any menstrual cycle, if a woman is susceptible to ovulation the probability of ovulation is equal to  $g$  and is constant till she gets ovulatory menstruation.

These assumptions are similar to those in Pathak except A<sub>3</sub>. Now, if

$p$  = the monthly chance of an L-conception

$\pi$  = the monthly probability of a conception ending in a foetal loss, and

$q$  = the monthly probability of no conception then they are, under our assumptions, given by

$$P = (1 - \theta) \S$$

$$Q = (1 - \S) \quad \dots (2.1)$$

$$\Pi = \theta \S$$

Under the above assumptions, probability that  $r^{\text{th}}$  L-conception occurs in month  $t$ , is

$$\begin{aligned} P(r, t) = & \alpha p^r \sum_{v=0}^b \frac{(v+r+y-1)!}{(r-1)!v!y!} \pi^v q^y \\ & + (1-\alpha) p^r g \sum_{v=0}^{b'} \sum_{x=0}^R \frac{(v+r+y'-1)!}{(r-1)!v!y'!} \pi^v q^{y'-x} g^x \quad \dots (2.2) \end{aligned}$$

where  $y = t - (r-1)m - vw - 1$

$$b \leq \left\lfloor \frac{t - (r-1)m - 1}{w} \right\rfloor$$

$$y' = [t - x - (r-1)m - vw - 1]$$

$$R = t - (r-1)m - vw - 1$$

$$\text{and } b' \leq \left\lfloor \frac{t - x - (r-1)m - 1}{w} \right\rfloor$$

when  $\theta = 0$  and  $r = 1$ , the results of Pathak are obtained.

The first four factorial moments of  $x_r$ , the time until  $r$ th L-conception are

$$M_1 = G + (1 - \alpha) x \quad \dots \quad (2.3)$$

$$M_2 = G^2 + H + 2(1 - \alpha) x (G + x) \quad \dots \quad (2.4)$$

$$M_3 = G^3 + 3GH + K + 3(1 - \alpha) x [2x^2 + G^2 + 2Gx + H] \quad \dots \quad (2.5)$$

$$M_4 = G^4 + 6G^2H + 4GK + 3H^2 + L - 4(1 - \alpha) x [6x^3 + 3G^2x + G^3 + 6GH^2 + 3Hx + 3GH + K] \quad \dots \quad (2.6)$$

where

$$x = \frac{g}{g} \quad \dots \quad (2.7)$$

$$G = (r-1)m + 1 + r \frac{(q + \pi w)}{P} \quad \dots \quad (2.8)$$

$$H = [- \{ (r-1)m + 1 \} + r \pi \frac{w(w-1)}{P} + \frac{r(q + \pi w)^2}{P^2}] \quad \dots \quad (2.9)$$

$$K = 2 \{ (r-1)m + 1 \} + \frac{r \pi w(w-1)}{P} \frac{(w-2)}{P} + \frac{3r \pi w(w-1)(q + \pi w)}{P^2} + \frac{2r(q + \pi w)^3}{P^3} \quad (2.10)$$

$$L = -6 \{ (r-1)m + 1 \} + \frac{r \pi w(w-1)(w-2)(w-3)}{P} + \frac{r \pi w(w-1)(w-2)(q + \pi w)}{P^2} + \frac{r \pi w(w-1)(q + \pi w)^2}{P^3} + \frac{6r(q + \pi w)^4}{P^4} \quad \dots \quad (2.11)$$

With the help of these, the mean and variance of the waiting time for  $r^{\text{th}}$  live birth are given by (assuming the gestation period of 9 months for a L-conception).

$$= (r-1)m + r(q + \pi w) + 10 + (1 - \alpha) x \quad \dots \quad (2.12)$$

$$= G + H + (1 - \alpha) x \{ 1 + x(1 + \alpha) \} \quad (2.13)$$



### Application

Data is usually not available for waiting times upto a higher parity. Singh has, however, given data on the waiting time of first conception for a cohort of women for whom age at effective marriage (*Gauna*) is 15 years<sup>^</sup>. But he has used a correction in his raw data to get data on waiting times. Probability function for the waiting time for first birth is obtained by putting  $r = 1$  in (2.115). As such

$$P(1, t) = \alpha P \sum_{v=0}^b \frac{(v+y-1)!}{v! y!} \pi^v q^y + (1-\alpha) pg \sum_{v=0}^b \sum_{x=0}^R \left( \frac{(v+y'-1)!}{v! u'!} \pi^v q^{y'} \frac{-x}{g} \right) \dots (3.1)$$

It is very difficult to get solution for all possible values of  $v$ . Explicit solutions, are, therefore, obtained for cases  $v = 1$  and  $v = 2$  in the first instance, which seem quite relevant.

Case 1:  $v = 1$

The period of non-susceptibility varies with the various types of pregnancy terminations. However, fluctuation in this period associated with foetal wastages is less among different groups of women. With empirical evidence, in our model here, we take  $w = h$  months. So final expression comes out to be

$$P(1, t) = \alpha p \sum_{x=1}^{t-1} q^{t-x-1-\frac{x}{g}} + \sum_{x=1}^{t-5} (t-x-4) \pi q^{t-x-5-\frac{x}{g}} + (1-\alpha) pg \sum_{x=1}^{t-1+(t-4)} \pi q^{t-5} \dots (3.2)$$

Here for the probability mass associated with  $v = 2$ , the probabilities  $P(1, t)$  as calculated are simply inflated by that multiplied which gives

$$\sum_{t=1} P(1, t) = 1.0$$

Case 2:  $v = 2$

$$\begin{aligned}
 P(1, t) = & \alpha p \left[ q^{t-1} + (t-4) \pi q^{t-5} + \frac{(t-7)(t-8)}{2} \pi^2 q^{t-9} \right] \\
 & + (1-\alpha) p g \left[ q^{t-1} + (t-4) \pi q^{t-5} + \frac{(t-7)(t-8)}{2} \pi^2 q^{t-9} \right. \\
 & + \sum_{x=1}^{t-1} q^{t-x-1-x} \pi^x g + \sum_{x=1}^{t-5} (t-x-4) q^{t-x-5} \pi^{t-x} \pi^x g + \sum_{x=1}^{t-5} \\
 & \left. \frac{(t-x-7)(t-x-8)}{2} \pi^{2t-x-9} \pi^x g \right] \quad \dots (3.3)
 \end{aligned}$$

Here too, for the probability mass associated with  $v \geq 3$ , the probabilities  $P(1, t)$  as calculated are simply inflated by that multiplier which gives

$$\sum_{t=1}^{\infty} P(1, t) = 1.0$$

Models (3.2) and (3.3) include four parameters, namely,  $\theta$ ,  $g$  and  $\alpha$ . It seems that these four parameters may be estimated with the help of first four factorial moments but the resulting equations become intractable. Due to the complexity of the model other well-known estimation procedures are also not applicable. Here parameter  $\alpha$  can be estimated with the help of first moment if we have some idea about the remaining three parameters  $\theta$ ,  $g$  and  $\xi$ . On the basis of information gathered about 1,765 pregnancies in Khanna study (11 villages in rural Punjab, India) Potter *et al.* Found an abortion rate of 100 per 1000 pregnancies. Therefore, value of  $\theta$ -may is approximately taken as 0.10. Pathak fitted his model using the estimate of  $\xi$  and  $g$  obtained with the help of two factorial moments<sup>3</sup>. His estimates come out to be  $\xi = .039$  and  $g = .01748$ . Therefore, with  $\theta = 0.10$ ,  $\xi = .039$  and  $g = .01748$  and equation (3.1) for  $r = 1$ , we get  $\alpha = .81824$ . Now, having some idea about the values of the parameters, modified minimum estimates may be obtained so that we get the best fit to the observed distribution. Expected frequencies computed on the basis of these estimates of the parameters along with the observed distribution of waiting time for first conception are given in tables 1 and 2. It is interesting to note that model describes the data quite satisfactorily in each case.

TABLE 1  
DISTRIBUTION OF OBSERVED AND EXPECTED COUPLES  
(WITH FEMALE'S AGE 15 AT R.M.)

| Time of first conception in months | Observed number of couples* | Expected number of couples* | Expected Number of Couples                                                                                           |                                                                                                                    |                                                                                                       |
|------------------------------------|-----------------------------|-----------------------------|----------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|
|                                    |                             |                             | First Trial                                                                                                          | Second Trial                                                                                                       | Third Trial                                                                                           |
|                                    |                             |                             | $\chi^2 = .81824,$<br>$\tilde{p} = .03510,$<br>$\tilde{q} = .0039,$<br>$\tilde{q} = .96100,$<br>$\tilde{g} = .01748$ | $\chi^2 = .825917$<br>$\tilde{p} = .04050,$<br>$\tilde{q} = .0045,$<br>$\tilde{q} = .955,$<br>$\tilde{g} = .01684$ | $\chi^2 = .826296,$<br>$\tilde{p} = .03780,$<br>$\tilde{q} = .0042,$<br>$q = .95800,$<br>$g = .01398$ |
| 1-7                                | 47                          | 40.49                       | 43.46                                                                                                                | 49.62                                                                                                              | 46.64                                                                                                 |
| 8-31                               | 96                          | 91.73                       | 94.33                                                                                                                | 99.65                                                                                                              | 96.33                                                                                                 |
| 32-55                              | 50                          | 49.33                       | 46.01                                                                                                                | 43.08                                                                                                              | 44.56                                                                                                 |
| 56-79                              | 17                          | 26.55                       | 23.27                                                                                                                | 19.88                                                                                                              | 20.93                                                                                                 |
| 80-103                             | 11                          | 13.69                       | 12.31                                                                                                                | 9.96                                                                                                               | 10.89                                                                                                 |
| 104-127                            | 5                           | 8.27                        | 6.61                                                                                                                 | 5.42                                                                                                               | 6.18                                                                                                  |
| 128-151                            | 5)                          | 4.19)                       | 3.94)                                                                                                                | 3.05)                                                                                                              | 3.79)                                                                                                 |
| 152 and over                       | ) 13<br>8)                  | ) 9.00<br>4.81)             | ) 13.01<br>9.07)                                                                                                     | ) 11.39<br>8.34)                                                                                                   | ) 13.47<br>10.68)                                                                                     |
| Total                              | 239                         | 239.00                      | 239.00                                                                                                               | 239.00                                                                                                             | 239.00                                                                                                |
| Value of $\chi^2$                  |                             | 8.82                        | 2.88                                                                                                                 | 2.16                                                                                                               | 1.64                                                                                                  |
| d.f.                               |                             | 6                           | 3                                                                                                                    | 3                                                                                                                  | 3                                                                                                     |

\*Source: Singh, S.N. (1964) On the Time of First Birth, *Sankhya Series B*, Vol. 26, (Table 2 on page 100), pp. 95-101.

TABLE 2

DISTRIBUTION OF OBSERVED AND EXPECTED COUPLES  
(WITH FEMALE'S AGE 15 AT R.M.)

| Time of first conception in months | Observed number of couples* | Expected number of couples* | Expected Number of Couples                                                                                                |                                                                                                                          |                                                                                                                           |
|------------------------------------|-----------------------------|-----------------------------|---------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|
|                                    |                             |                             | First Trial                                                                                                               | Second Trial                                                                                                             | Third Trial                                                                                                               |
|                                    |                             |                             | $\tilde{x} = .81824,$<br>$\tilde{p} = .03510,$<br>$\tilde{\pi} = .0039,$<br>$\tilde{q} = .96100,$<br>$\tilde{g} = .01748$ | $\tilde{x} = .825917,$<br>$\tilde{p} = .04050,$<br>$\tilde{\pi} = .0045,$<br>$\tilde{q} = .955,$<br>$\tilde{g} = .01684$ | $\tilde{x} = .82696,$<br>$\tilde{p} = .03780,$<br>$\tilde{\pi} = .0042,$<br>$\tilde{q} = .95800,$<br>$\tilde{g} = .01398$ |
| 1-7                                | 47                          | 40.49                       | 43.46                                                                                                                     | 49.64                                                                                                                    | 46.65                                                                                                                     |
| 8-31                               | 96                          | 91.73                       | 94.34                                                                                                                     | 99.83                                                                                                                    | 96.49                                                                                                                     |
| 32-55                              | 17                          | 49.33                       | 46.42                                                                                                                     | 43.61                                                                                                                    | 44.63                                                                                                                     |
| 56-79                              | 17                          | 26.55                       | 23.76                                                                                                                     | 20.41                                                                                                                    | 21.43                                                                                                                     |
| 80-103                             | 11                          | 13.69                       | 12.71                                                                                                                     | 10.33                                                                                                                    | 11.27                                                                                                                     |
| 104-127                            | 5                           | 3.27                        | 7.09                                                                                                                      | 5.65                                                                                                                     | 6.43                                                                                                                      |
| 128-151                            | 5                           | 4.19                        | 4.12                                                                                                                      | 3.40                                                                                                                     | 3.94                                                                                                                      |
| 152 and over                       | 8                           | 4.81                        | 7.10                                                                                                                      | 6.13                                                                                                                     | 8.16                                                                                                                      |
|                                    |                             | 9.00                        | 11.22                                                                                                                     | 9.53                                                                                                                     | 12.10                                                                                                                     |
| Total                              | 239                         | 239.00                      | 239.00                                                                                                                    | 239.00                                                                                                                   | 239.00                                                                                                                    |
| Value of $\chi^2$                  |                             | 8.82                        | 3.64                                                                                                                      | 3.17                                                                                                                     | 1.99                                                                                                                      |
| d.f.                               |                             | 6                           | 3                                                                                                                         | 3                                                                                                                        | 3                                                                                                                         |

\*Source: Singh, S.N. (1964) On the Time of First Birth, *Sankhya Series B*, Vol. 26, (Table 2 on page 100), pp. 95-101.

## ***Discussion***

A particular case of the proposed model seems suitable for describing the waiting time distribution for the first birth of a married woman when she gets married at an early age. Incidentally, this approach facilitates the estimation of the parameters relating to adolescent sterility, fecund-ability, and incidence of foetal loss and so on from the data on the time of first births to women. The model initially proposed by Pathak for the time of first conception, when applied to the data on the time of first birth on the assumption that there is one to one correspondence between a conception and a live birth, gives the tinder estimate of  $\alpha$ . However, our model relaxes the assumption of one to one correspondence between conception and live birth. Consequently, estimate of non-fecund women at age 15 comes out to be 17 per cent which is less than the estimate obtained by Pathak. This estimate seems to be more reasonable. The estimate of  $p$  is, no doubt, low but consistent with the finding of Singh *et al*. However, the fact that case  $v = 2$  yields a slightly weaker fit to the data than case  $v = 1$  may be artifact of the estimation procedure namely, use of values for  $\$$  and  $g$  that are derived from application of a simpler model predicted on  $v = 0$  and because the iterations have terminated at three only.

It is to be noted that a married woman may easily recall the number of children ever born to her. She may also recall the time of her last delivery accurately. It may be mentioned that the estimates of different parameters in the model would normally depend on the data being used for their estimation even if women are assumed in the model to be homogeneous with respect to these parameters. For example, estimate of parameter  $q$  from the data on the waiting times of higher order births may be underscored as compared to the one estimated from the data on the waiting times of lower order births. Similar problems exist in estimation of other parameters. Perhaps, these parameters may be better estimated from the data on the number of children born during the whole period of marital union at the time of survey but in estimating more than two or three parameters, the number of degrees of freedom often reduced to one so that one cannot easily validate the model. The model also does not take into account the fact that acquisition of full fecund ability is a progressive process, with the ratio of ovulatory to

anovulatory menstrual cycles rising gradually rather than an abrupt transition from a consecutive series of anovulatory cycles to an uninterrupted series of ovulatory ones. As such, the proposed model is quite restrictive one and can easily be made more realistic and comprehensive by making the parameters to vary among the females as well as over the age for the same female.

Notwithstanding its limitations, the model can also be applied in other similar situations such as one where the women use IUD or pill for spacing their births immediately after their delivery but start dropping out the use of contraception because of some reasons to their own and it is required to estimate the level of fecund ability and rate of drop out from the data on their related conceptive delays.

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## **SOCIO-ECONOMIC PROFILE AND PERFORMANCE OF CHVs IN GUJARAT: IMPLICATIONS FOR SELECTION AND SUPPORT '**

**Anil Bhatt\*, Rushikesh Maru\* and A.S. Prabhakar\***

### *ABSTRACT*

*What type of person should be selected as Community Health Volunteer (CHV) has been a matter of debate. This study relates socio-economic characteristics - age, sex, marital status, education, caste, organization member's hip and land-ownership - with performance on direct patient care, mother and child health, family welfare and environmental sanitation. The paper further suggests strategies for selection, training and support in case of CHVs whose performance is poor.*

Since the inception of the Community Health Workers' Scheme in 1977 there has been a considerable discussion on what type of a person a Community Health Volunteer (CHV) now known as health guide, should be. This discussion has acquired greater significance because for the first time in a development programme a member of the community was trained and supported by the government but not within its administrative control. Since considerable importance had been attached to the scheme and as it was to be introduced on a large scale its success was considered crucial. According to the government sources there were 1, 60,000 CHVs working in the country in 1981. The outcome of this innovation was keenly observed by the medical profession who was initially hostile to the scheme and also by other developmental agencies who might want to emulate the scheme for similar community based development programmes. The type of person who is selected as CHV, therefore, becomes an important issue for the effective functioning of the scheme.

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When the scheme was launched in October 1977, the Government of India issued guidelines which provided that a CHV should be below 30 years of age and should have a formal education up to sixth standard. Subsequent communications and revised guidelines have suggested that people from scheduled castes and tribes and women should be encouraged to become CHVs. Also, according to revised guidelines, persons above the age of 30 years should be preferred as CHVs. Ideally a person acceptable to the rural community, willing to serve the community and enjoying the confidence of the village people should be selected as the CHV.

However, such characteristics as commitment to social service, acceptability to the community, being in confidence of the community are all highly subjectively determined and difficult to ascertain characteristics. Moreover, when the scheme was to be implemented on a massive scale, accompanied by usual bureaucratic symptoms of delays, inadequate communications from the upper levels of the administration, irregular supply of equipments, such subtler and higher order criteria of selection remain on the paper only. Add to this, the unwilling if not hostile medical officers and the usual politicking and nepotism of the more powerful sections of the rural society to get the share of the government spoils. In such a situation no amount of pious proclamations on commitment and honesty as criteria of selection would help achieve better performance.

Perhaps, the more realistic and feasible criteria could have been relatively easily ascertainable objective credentials of socio-economic characteristics such as age, sex, occupation, caste, education etc., if these have any bearing on the performance and effectiveness of the scheme.

Many studies of the CHV scheme have analyzed socioeconomic background of the CHVs<sup>1-10</sup>. Some of these studies discuss the relevance of age, sex, caste, education, and occupation for the selection of CHVs<sup>1-9,10</sup>. Similarly, a few studies have also analyzed performance of CHVs<sup>7-9,10,11</sup>. However, none of these studies have systematically attempted to relate performance indicators to socio-economic characteristics of CHVs. The 1979 national evaluation of the CHV scheme did make a beginning in this direction by relating average number of cases visited by CHVs in the past fortnight with their socio-economic background<sup>9</sup>. However, it was



limited to only three background indicators of sex, caste and occupation. Also, the single indicator of performance did not distinguish between various activities such as direct patient care, family planning, MCH, and environmental sanitation.

To what extent does the socio-economic background, determine the performance of the CHV? Are there any particular services which are performed better by certain type of CHVs? It is to these questions that we address ourselves in this study. If there are any socio-economic determinants of performance then it would help to identify these for selection. Moreover, one can also decide about the interventions that the scheme would need in case of poor performance by certain types of CHVs. Based on the analysis of Gujarat data the paper attempts to discuss the strategies for selection and support for better performance of the CHV scheme.

### ***The Study***

The study is based on data collected for Gujarat State as a part of larger national evaluation of the CHV scheme<sup>2</sup>. The data was collected during the summer of 1979.

The sample consisted of 6 CHVs for each sample PHC, half of whom were selected randomly while the remaining half were from the previous evaluation done in 1978<sup>13</sup>. Ten PHCs were included in the sample based on stratified random method. Two of the 60 selected CHVs could not be interviewed. Thus, the total sample consisted of 58 CHVs from 10 PHCs in 10 districts of Gujarat State. Study of CHV scheme from Gujarat State becomes more important because there has been an enthusiastic acceptance of the scheme on the part of Gujarat Government as it had provided added support to the scheme and by all accounts, the working of the scheme has been relatively much better as compared to other States.

### ***Measures of Performance and Socio-economic Characteristics***

Measures of performance included in this study and the socio-economic profile of the CHV in the State are shown in tables 1 and 2 respectively. The measures of performance are clustered into four parts/types of activities based on nature

of services rendered. These are: (i) direct patient care (DPC) which includes such activities as minor ailments treated, blood slides collected etc., (ii) maternal and child health (MCH) that consists of number of children referred for vaccination, malnutrition, number of mothers referred for pre-natal care, post-natal care etc., (iii) family welfare (FW), and (iv) environmental sanitation (ES).

TABLE 1  
INDICATORS OF PERFORMANCE

- 
1. Direct Patient Care (DPC)
    - Number of blood slides prepared
    - Number of cases given treatment
    - Number of minor ailments treated
  2. Maternal and Child Health (MCH)
    - Number of children referred and got vaccinated
    - Number of children referred for malnutrition
    - Number of children referred for Vitamin A solution
    - Number of cases referred for pre-natal care
    - Number of cases referred for post-natal care
    - Number of cases referred for natal care
  3. Family Welfare (FW)
    - Cases referred for IUD
    - Cases referred for sterilization
    - Cases referred for MTP
    - Cases referred for FP advice
  4. Environmental Sanitation (ES)
    - Average number of chlorination's per well
    - Number of soakage pits constructed
    - Number of compost pits constructed
    - Number of sanitary latrines constructed
- 

The index for each service consists of simple additive scale of different activities for each type.

The performance under each type was ordered into poor, average and good. The scores in four types were converted into standard normal varieties using the mean and standard deviation of a set of scores. The CHVs whose performance score, thus, calculated was less than or equal to -1 were classified as 'poor', between -1 and +1 as "average" and more than or equal to +1 as "good".

The distribution of Gujarat CHVs in various socioeconomic categories is provided in table 2. The all India profile is also provided for ready comparison. We find that a high percentage of CHVs in Gujarat are younger, males (though here it may be noted that Gujarat has nearly one-fourth of the CHVs who are female as compared to only six per cent for all States combined), married, having more than primary education and belonging to non-scheduled caste/scheduled tribe castes. While more than ninety per cent of

TABLE 2  
SOCIO-ECONOMIC PROFILE OF GUJARAT CHVs

| S.No. | Socio-economic characteristics               | Gujarat State Percentages (N - 58) | All States combined |
|-------|----------------------------------------------|------------------------------------|---------------------|
| 1.    | Average Age (Years) Less than 30             | 27.6<br>65.5                       | 26.3<br>65.9        |
| 2.    | Proportion of female CHVs                    | 24.1                               | 6.3                 |
| 3.    | Marital Status                               | 82.8                               | 73.8                |
|       | Married                                      | 17.2                               | 26.2                |
|       | Unmarried/Widowed                            |                                    |                     |
| 4.    | Educational Status                           | 37.9                               | 29.4                |
|       | Primary                                      | 62.1                               | 70.6                |
|       | More than primary                            |                                    |                     |
| 5.    | Vocation                                     | 91.4                               | 98.2                |
|       | Non-medical background Medical background    | 8.6                                | 1.8                 |
| 6.    | Membership in organisation Member Non-member | 34.5<br>65.5                       | N.A.<br>N.A.        |
| 7.    | Caste                                        | 79.3                               | 78.8                |
|       | Non-SC/ST SC/ST                              | 20.6                               | 21.2                |
| 8.    | Landownership Owner Non-owner                | 55.2<br>44.8                       | N.A.<br>N.A.        |

N.A = Not available

CHVs in Gujarat are without any medical background, the proportion of CHVs with medical background is nine per cent which is much higher than the all India proportion of less than two per cent with medical background. It is also striking that more than one-third of CHVs in Gujarat are members of some public organization and, therefore, having some exposure to cooperative, organized activity beyond one's primary group. It is also noteworthy that nearly 45 per cent of the CHVs in Gujarat do not own any land.

### *Age and Performance*

Considerable importance has been attached to the age of the CHV, As mentioned above, within three years of launching the scheme "the government have changed guidelines on this issue twice. Initially, younger CHVs were to be preferred in selection. In the revised guidelines, it has been suggested that CHVs above thirty should be preferred. Many doctors with whom we have discussed this aspect in different .States have also repeatedly mentioned that CHVs should be middle aged or "matured" in age. To quote a district level medical officer from Rajasthan, "in this type of a scheme some mature middle aged persons should be selected instead of the young boys in their 20s".

The evidence from Gujarat presented in table 3, however, shows that age is not a major determinant of performance. It is not necessary that only middle aged CHVs would do better. In fact in both MCH and FW activities the younger generation has been performing relatively better than the CHVs above thirty. As the table indicates in MCH activity about 8 per

TABLE 3  
AGE AND PERFORMANCE

| Type of Care               | Aged below 30 N=38 (65.5%) |         |      | Aged above 30 N=20 (34.5X) |         |      |
|----------------------------|----------------------------|---------|------|----------------------------|---------|------|
|                            | Poor                       | Average | Good | Poor                       | Average | Good |
| Direct patient care        | 21.0                       | 50.0    | 29.0 | 20.0                       | 50.0    | 30.0 |
| Maternity and child health | 13.2                       | 78.9    | 7.9  | 25.0                       | 70.6    | 5.0  |
| Family Welfare             | 28.9                       | 44.7    | 26.4 | 50.0                       | 25.0    | 25.0 |
| Environmental sanitation   | 21.1                       | 65.8    | 13.2 | 25.0                       | 50.0    | 25.0 |
| Overall                    | 21.1                       | 59.8    | 19.1 | 30.0                       | 48.8    | 21.2 |

cent of below 30 CHVs are doing "Good" as compared to 5 per cent of the above 30 CHVs. In case of environmental sanitation (ES), one fourth of the older CHVs performance is rated as good as against only 13 per cent of the younger CHVs. But in case of direct patient care (DPC) there is no noteworthy difference between young and older CHVs performance. On the whole, therefore, there is not much significant difference in performance between younger and middle aged CHVs.

### ***Sex and Performance***

There has been again a considerable concern shown over female CHVs' performance. The latest revised guidelines, strongly recommended that as far as possible females should be selected as CHVs.

Data shows that female CHVs performance is slightly better in case of MCH and FW activities (table 4). Though in FW more female CHVs have poor performance than male CHVs yet in the category "Good" female proportion is nearly 29 per cent as against 25 per cent males. In case of direct patient care male CHVs are doing better than females. In case of environmental sanitation 29 per cent of the female CHVs performance is rated as good as against about 14 per cent of male CHVs. Overall there is not much significant difference but one may say that if, CHV scheme is to emphasize MCH, and ES more than curative service than female CHVs would do equally well or slightly better than male CHVs. The 1979 national evaluation of CHV scheme also found that sex is not a significant determinant of performance<sup>4</sup>.

TABLE 4  
SEX AND PERFORMANCE

| Type of care               | Male N=33 (75.9%) |         |      | Female N=14 (24.12) |         |      |
|----------------------------|-------------------|---------|------|---------------------|---------|------|
|                            | Poor              | Average | Good | Poor                | Average | Good |
| Direct patient care        | 18.2              | 50.0    | 31.8 | 28.6                | 50.0    | 21.4 |
| Maternity and child health | 18.2              | 75.0    | 6.8  | 14.3                | 78.6    | 7.1  |
| Family Welfare             | 34.1              | 40.9    | 25.0 | 42.8                | 28.6    | 28.6 |
| Environmental sanitation   | 20.5              | 65.9    | 13.6 | 28.6                | 42.8    | 28.6 |
| Overall performance        | 22.8              | 56.8    | 20.5 | 28.6                | 50.0    | 21.4 |

### ***Marital Status and Performance***

Unmarried CHVs do better in DPC and MCH as compared to married CHVs as can be observed from table 5. In case of family welfare activities 50 per cent of unmarried CHVs performance is rated as "good" as compared to about 21 per cent married CHVs. However, nearly 40 per cent of unmarried CHVs are found to be in poor category as compared to 35 per cent married CHVs. In case of environmental sanitation, however, the married CHVs perform significantly better than unmarried CHVs. Overall, 80 per cent of unmarried CHVs perform average to good as compared to about 75 per cent of married CHVs.

### ***Educational Status***

Another aspect of CHV selection which has generated considerable discussion is the educational background of CHVs. It has been generally believed that the CHVs should have some education to be able to work effectively. The government in its guidelines has suggested that all CHVs should have primary education, at least up to VI grade. One of the major complaints of the medicos is that CHVs are ill-educated and therefore, cannot perform their functions well. Many doctors from Uttar Pradesh, Rajasthan and Gujarat have consistently mentioned this point during our discussions with them. Quite a few doctors have expressed the view that CHVs

TABLE 5  
MARITAL STATUS AND PERFORMANCE

| Type of care               | Married N=48 (82.8%) |         | Unmarried N=10 (17.2%) |      |         |
|----------------------------|----------------------|---------|------------------------|------|---------|
|                            | Poor                 | Average | Good                   | Poor | Average |
| Direct patient care        | 22.9                 | 47.9    | 29.2                   | 10.0 | 60.0    |
| Maternity and child health | 18.8                 | 75.0    | 6.2                    | 10.0 | 80.0    |
| Family Welfare             | 35.4                 | 43.8    | 20.8                   | 40.0 | 10.0    |
| Environmental sanitation   | 16.7                 | 64/5    | 18.8                   | 50.0 | 40.0    |
| Overall performance        | 25.0                 | 56.2    | 18.7                   | 20.0 | "50.0   |

should at least be matriculates. It is widely felt that only people with some education will be able to understand and can effectively participate in the training. Even elementary medical work, it is argued, can only be performed by educated persons.

Data presented in. table 6 shows that CHVs with education up to middle school and above have performed consistently better in all. Activities and especially and expectedly in the area of direct patient care. In case of MCH more than one-fourth of the CHVs with primary education have performed poorly as compared to one-tenth of CHVs with middle school and above education. If one compares the good performance category in case, of MCH then nearly double the CHVs with education up to middle schools or above are to be found in good performance category as compared to CHVs having education upto primary level.

Education, however, is in a sense an enabling variable. One would expect that other things being equal an educated person is more exposed to outer world, to new and different things and therefore, his ability to acquire knowledge, assimilate and use training would be higher; thereby chances of improvement in his performance are greater. But if these conditions can be met with more intensive training and follow up then CHVs with low education or even no education, as in case of Jamkhed, may perform better<sup>14</sup>.

TABLE 6  
EDUCATION AND PERFORMANCE

| Type of care               | Primary | N=22 (37.921)<br>Average | Good | Middle & | Above N-36 |
|----------------------------|---------|--------------------------|------|----------|------------|
|                            | Poor    |                          |      | Poor     | Average    |
| Direct patient care        | 27.3    | 50.0                     | 22.7 | 16.7     | 50.0       |
| Maternity and child health | 27.3    | 68.2                     | 4.5  | 11.1     | 80.6       |
| Family Welfare             | 45.4    | 27.3                     | 27.3 | 30.6     | 44.4       |
| Environmental sanitation   | 22.7    | 63.3                     | 13.7 | 22.3     | 58.3       |
| Overall performance        | 31.8    | 54.5                     | 13.6 | 19.4     | 55.6       |

### ***Organizational Membership and Performance***

Data about organizational membership and performance are shown in table 7. It clearly shows that those CHVs who are members of organization other than their primary groups have performed consistently better in all activities than those CHVs who are not members of any organization.

Like education, membership in organization is also indicative of a more outgoing, broader, more exposed personality. It is also likely to indicate a greater power, status and extension or service motivation. People with these motivations are likely to be more confident, more interactional, more active and more involved. As members of organizations they are exposed to activities other than their primary group activities, they Interact with different people, learn to work in groups and in cooperative fashion. As active persons it is very likely that they may have easier accessibility to government personnel. These qualities are obviously more conducive to doing the type of work that a CHV is expected to do.

TABLE 7  
ORGANISATIONAL MEMBERSHIP AND PERFORMANCE

| Type of care               | without membership in any organization N=38 (65.5%) |         | Membership in organization N=20 (34.52) |      |         |
|----------------------------|-----------------------------------------------------|---------|-----------------------------------------|------|---------|
|                            | Poor                                                | Average | Good                                    | Poor | Average |
| Direct patient care        | 23.7                                                | 47.8    | 28.9                                    | 15.0 | 55.0    |
| Maternity and child health | 21.1                                                | 73.7    | 5.2                                     | 10.0 | 80.0    |
| Family Welfare             | 42.1                                                | 34.2    | - 23.7                                  | 25.0 | 45.0    |
| Environmental sanitation   | 31.6                                                | 55.3    | 13.1                                    | 5.0  | 70.0    |
| Overall performance        | 28.9                                                | 55.3    | 15.8                                    | 15.0 | 55.0    |



In all types of services those CHVs who owned some land have done consistently better as compared to those who do not own land (table 8). Overall double the number of CHVs with land (25.8%) is to be found in "good" performance category as compared to CHVs who do not own any land (12.4%).

### ***Caste and Performance***

The caste and performance relationship has been shown in table 9. Except in case of MCH activities the performance of CHVs belonging to higher caste is considerably better than CHVs belonging to scheduled castes and tribes. In case of direct patient care the performance of the upper castes is decidedly better. The table shows that only 13 per cent of the non-SC/ST CHVs perform poorly as compared to half of the SC/ST CHVs. In family welfare also not a single SC/ST shows up in the category good as compared to more than 32 per cent of CHVs with upper caste status. In case of MCH activity the performance of the SC/ST CHVs is slightly better but it is very negligible - by about one per cent in all the three performance categories - to be able to arrive at any definite conclusion.

This is perhaps to be expected. Given the social position of these low-caste groups their ability to interact with others and their acceptance by upper sections of the society is very limited. Their confidence level is also likely to be low. In such a situation it is not possible to expect better performance from the traditionally deprived groups to do better than upper caste groups unless they are more carefully trained and generally more strongly supported by the health administration.

### ***Conclusion: Strategies for Selection and Support***

Looking at different socio-economic dimensions of CHVs performance it can be observed that a better performing CHV is generally educated up to at least middle school, a landowner, member of the upper caste and a member of some organization. He may be married or unmarried, young or middle aged, male or female. It can be legitimately argued that performance of the CHV should not be measured only in terms of quantity of services rendered. We must also look at the type of clients they are serving<sup>1,2, 6,8,9</sup>. Since one of the major objectives of such community based intervention is to reach under-privileged strata of rural population, would it?

TABLE 8

## LANDOWNERSHIP AND PERFORMANCE

| Type of care               | Without land N=26 (44.82) |         |      | With land N=32 (55.2x) |         |      |
|----------------------------|---------------------------|---------|------|------------------------|---------|------|
|                            | Poor                      | Average | Good | Poor                   | Average | Good |
| Direct patient care        | 26.9                      | 57.7    | 15.4 | 14.6                   | 43.8    | 40.5 |
| Maternity and child health | 15.4                      | 80.8    | 3.8  | 18.8                   | 71.8    | 9.4  |
| Family welfare             | 42.3                      | 38.5    | 19.2 | 31.3                   | 37.4    | 31.3 |
| Environmental sanitation   | 30.8                      | 57.7    | 11.5 | 15.6                   | 62.5    | 21.9 |
| Overall performance        | 28.9                      | 58.7    | 12.4 | 20.3                   | 53.9    | 25.8 |

TABLE 9

## CASTE AND PERFORMANCE

| Type of care               | SC/ST N=12 (20.6X) |         |      | Non SC/ST N=46n (79.32) |         |      |
|----------------------------|--------------------|---------|------|-------------------------|---------|------|
|                            | Poor               | Average | Good | Poor                    | Average | Good |
| Direct patient care        | 50.0               | 41.7    | 8.3  | 13.0                    | 52.2    | 34.8 |
| Maternity and child health | 16.7               | 75.0    | 8.3  | 17.4                    | 76.1    | 6.5  |
| Family welfare             | 58.3               | 41.7    | 0.0  | 30.4                    | 37.0    | 32.6 |
| Environmental sanitation   | 33.3               | 58.4    | 8.4  | 18.8                    | 52.5    | 18.8 |
| Overall performance        | 50.0               | 41.7    | 8.3  | 17.4                    | 58.7    | 23.9 |

not be logical to recruit CHVs from lower socio-economic strata, even if they are. not performing, as well as, CHVs from higher socio-economic strata? We have elsewhere analyzed the characteristics of clients served by CHVs from various socio-economic strata and found that on an average CHVs served all sections of society without considerations of caste and class<sup>0</sup>. Our analysis of other data from Gujarat (not reported here) also supports this conclusion.

Even if, CHVs do not discriminate between various strata of society in providing services, it would be important to recruit CHVs from lower socio-economic strata purely on the .ground of providing them equal share in the new opportunities opened up by the scheme.

If selection has to be made on the ground that a particular village needs a particular kind of activity more than the other, then more differential selection on the basis of socio-economic characteristics will have to be done. For instance, if one wants to emphasize family welfare activity more in a particular village as compared to direct patient care than one may prefer a younger person who is female and a member of the organization. An activity-wise selection strategy is suggested in table 10. It is only a suggestive table.

TABLE 10

ACTIVITYWISE SELECTION STRATEGY

| Socio-economic characteristics | Better        |               | Performance |               |
|--------------------------------|---------------|---------------|-------------|---------------|
|                                | D P C         | M C H         | F W         | E S           |
| Age                            | *             | Young         | Young       | Middle Aged   |
| Sex                            | Male          | Female        |             | Female        |
| Marital status                 | *             | Single        | A           | Married       |
| Education                      | Middle School | Middle School | *           | Middle School |
| Membership in the organization | Member        | Member        | Member      | Member        |
| Landownership                  | Owner         | *             | Owner       | Owner         |
| Caste                          | Non-SC/ST     | *             | Non-SC/ST   | Non-SC/ST     |

\*denotes uncertain or no relationship between particular socio-economic characteristic and performance in particular activity.

It is to be observed however, that socio-economic characteristics are not directly related to performance. The factors that affect the performance directly and more decisively are broader exposure, easier access to wider sections of community and different levels of government, confidence, commitment, social service motivation. The model of relationship between socio-economic profile and performance is as follows (Fig. I):

Our other data (not reported here) show that those who perceived their roles as CHVs more broadly and comprehensively show much better performance. It is simply that members coming from more dominant sections of the society have more opportunity to get wider exposure and, therefore, are better placed to have better understanding of such roles.

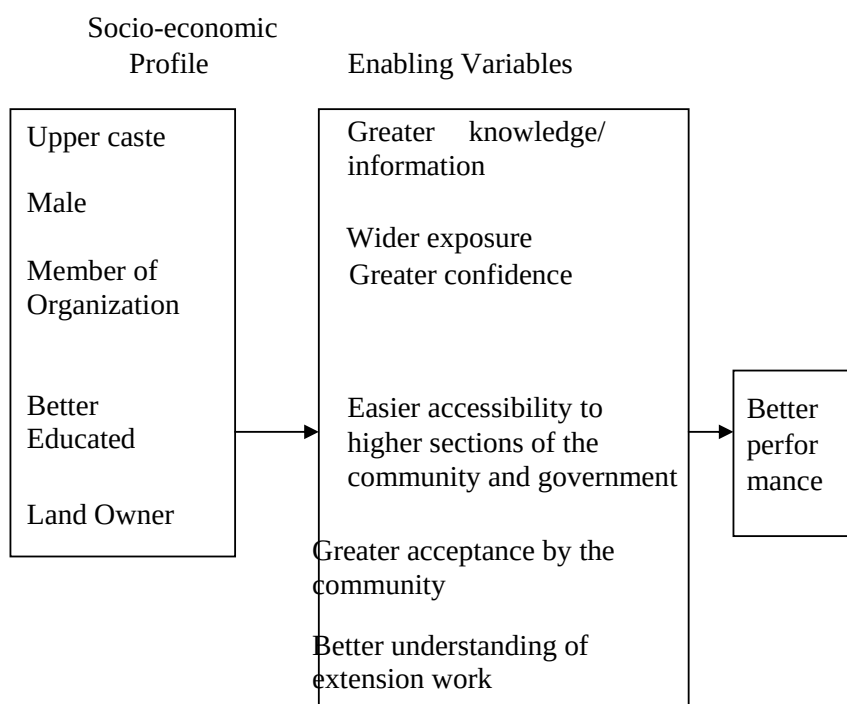


FIGURE 1

MODEL OF RELATIONSHIP BETWEEN SOCIO-ECONOMIC PROFILE AND PERFORMANCE OF CHVs

This, however, does not mean that members of lower socio-economic strata cannot perform better. Experience of several voluntary agencies has amply shown that when they have worked with CHV type functionaries in their health work with patience, greater care, careful training, continuous guidance and help and stronger support then even illiterate, landless, scheduled caste female village health workers have performed exceedingly well.

Aroles in Jamkhed block of Maharashtra have clearly demonstrated that illiterate, scheduled caste women have performed exceedingly well as CHVs and have performed more complicated functions including the "tension tests" for detecting glaucoma<sup>4</sup>. This, however, requires innovative techniques of training in an intensive and patient way, a committed and strong follow-up and support. It is, however, far more difficult to achieve in case of government run primary health centers where training is to be done enemas, within a fixed time period, with inadequate and irregular equipment supply and above all a general lack of interest, on the part of the PHC and its higher levels of health administration.

The difference between our findings and experiences of small voluntary community health care experiments highlights the classic problem of transition from pilot projects to nation-wide extension of a successful social innovation. As the scale of operation increases, the ability of the organization to provide intensive, continuing and personalized training and support also decreases. A certain degree of doing as routine and standardization becomes inevitable. Thus, both training and support systems are unable to differentiate between trainees with differential social background. One way to minimize this characteristic of large and complex system is to develop separate training and support interventions for CHVs from low socio-economic strata. Along with this, flexibility can be built into the system through decentralization of training design function and thereby encouraging regional variations. The strategy will then have to be stronger support at training and actual operation level to improve the performance of low socio-economic status CHVs as shown in Figure 2.

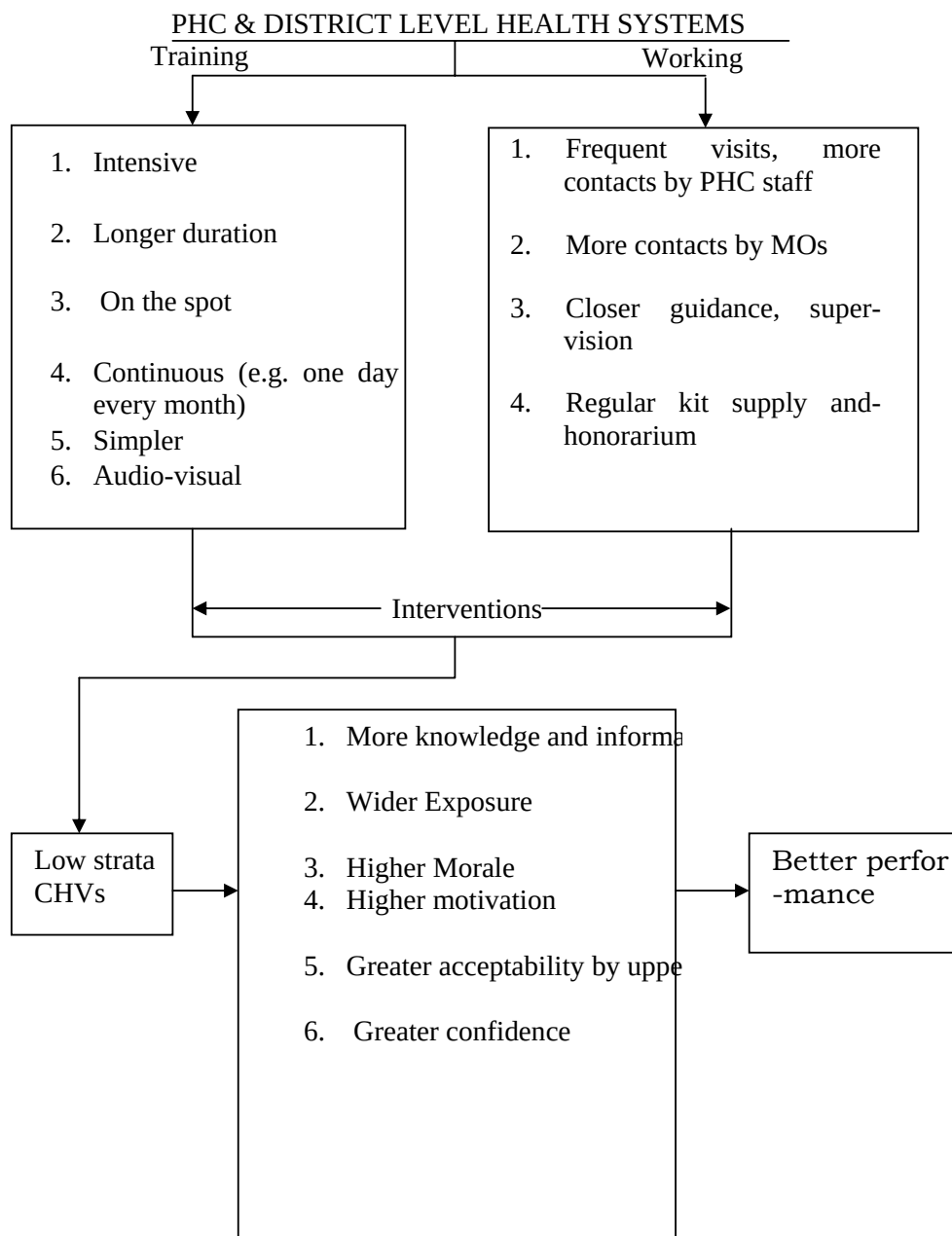


FIGURE 2

TRAINING AND SUPPORT FOR BETTER PERFORMANCE OF LOW  
SOCIO-ECONOMIC STRATA CHVs

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### **REPEAT MTPs - A PSYCHOSOCIAL REVIEW**

**Sheila Divekar\*, Gopu Natarajan\*\* and V. N. Purandare\*\*\***

#### *ABSTRACT*

*This paper deals with cases of repeat Medical Termination of Pregnancies (MTPs) done at the Family Planning Centre, KEM Hospital, Bombay. The authors collected the data by interviewing the patients with the help of questionnaire to find out the reasons for their repeat abortions. The paper reveals that the majority of the unmarried women gave reason for undergoing repeat MTPs because of social stigma whereas majority of the married women said that they wanted repeat MTPs for the sake of spacing. The paper also deals with other socio-economic and demographic characteristics of the respondents.*

The Medical Termination of Pregnancy (MTP) Act in India came into force in 1972. Since then the demand for abortions is rising steadily. This is, therefore, a matter of great concern because the growing number of women who have undergone abortions once, are at a risk of having repeat abortions, unless they use effective contraception methods.

The Government of India is concerned about the low health status of women in the country due to anemia, occurring on account of a multitude of social factors like malnutrition, poverty, poor sanitation etc. The already low health status may be further affected due to repeated abortions. Also, the cost involved in doing an abortion is quite high, if performed under aseptic conditions and by trained doctors.

The experience of gynecologists all over the world has shown that any currently available method of inducing

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abortion is not totally free from adverse effects even if carried out with utmost care, and may, in fact, impair the woman's fertility and health in some way or the other<sup>1</sup>. Medical termination of pregnancy is, therefore, emerging as a crucial maternal health issue.

### ***Materials and Methods***

During the period, May, 1979 to November, 1980, 2,994 MTPs were performed in the Family Planning Centre, KEM Hospital, Bombay. One hundred women, who during this period obtained a total of 218 MTPs, of which 161 were performed in KEM Hospital, were interviewed with the help of a questionnaire to find out the reasons for their repeat abortions and thereafter the data was analyzed. Actually, the number of women demanding repeat MTPs may be more as some of them do not give history of previous MTPs, and a few others might have given false names and addresses. These women came from Gynecological OPD or were directly referred to the Family Planning Centre by family physicians or friends.

### ***Results***

The Centre is open to all, but being situated in a labor area like Parel, is frequented by the lower socioeconomic class of people.

The socio-demographic profile is shown in table 1. In all 30 per cent of the patients were between 20 and 24 years. Out of 32 unmarried girls, 13 were less than 20 years of age.

TABLE1  
SOCIO- DEMOGRAPHIC CHARACTERISTICS  
A. Age and Marital Status

| Age (Years)  | Married | Unmarried | Total |
|--------------|---------|-----------|-------|
| 14           | -       | 3         | 3     |
| 15-19        | 3       | 10        | 13    |
| 20-24        | 23      | 15        | 38    |
| 25-29        | 27      | 2         | 29    |
| 30-34        | 10      |           | 11    |
| 35 and above | 5       | 1         | 6     |
| Total        | 68      | 32        | 100   |

(Table 2 Contd.)

## B. Age and Number of MTPs

| Age (Years)  | Number of MTPs |    |   |       |
|--------------|----------------|----|---|-------|
|              | 2              | 3  | 4 | Total |
| 14           | 2              | 1  |   | 3     |
| 15-19        | 11             | -  | 2 | 13    |
| 20-24        | 33             | 5  | - | 38    |
| 25-29        | 24             | 5  | - | 29    |
| 30-34        | 9              | 2  | - | 11    |
| 35 and above | 5              | 1  |   | 6     |
| Total        | 86             | 17 | 2 | 100   |

## C. Number of MTPs

| Parity      | 2  | 3  | 4 | Total |
|-------------|----|----|---|-------|
| 0           | 33 | 8  | — | 41    |
| 1           | 14 | 2  | - | 16    |
| 2           | 30 | 2  | 2 | 34    |
| 3           | 5  | 1  | - | 6     |
| 4 and above | 2  | 1  | - | 3     |
| Total       | 84 | 14 | 2 | 100   |

| Education | Married | Unmarried | Total |
|-----------|---------|-----------|-------|
| Nil       | 18      | 7         | 25    |
| Primary   | 11.     | 14        | 25    |
| Secondary | 10      | 7         | 17    |
| ssc       | 21      | 4         | 25    |
| Graduate  | 8       | -         | 8     |
| Total     | 68      | 32        | 100   |

| Employment Status |    |    |     |
|-------------------|----|----|-----|
| Employed          | 20 | 8  | 28  |
| Unemployed        | 48 | 24 | 72  |
| Total             | 68 | 32 | 100 |

| ReliRion  |    |    |     |
|-----------|----|----|-----|
| Hindu     | 49 | 29 | 78  |
| Muslim    | 5  | —  | 5   |
| Christian | 14 | 3  | 17  |
| Total     | 68 | 32 | 100 |

Out of the total 41 per cent of the women were nulliparous. About 50 per cent of the women had no education or just primary education. Among these respondents 33 per cent were unmarried and 30 per cent married women were employed.

It appears that the proportion of unmarried women was high perhaps, as the sample is from an urban area and the respondents belonged to low income group. Also, all the unmarried girls seeking abortions in this centre get special attention from social workers and are interviewed with the aim of giving them sex education and help in their rehabilitation.

The distribution according to religion shows that the problem exists in all religious classes.

Women's age at menarche and their reaction to it are shown in table 2. Twenty per cent of women started menstruating at or before age 12 years but 60 per cent of the girls had an adverse reaction to it.

A majority of married women gave 'failure of contraception and its irregular use'<sup>1</sup> as the reason for undergoing MTPs (Table 3). Amongst the unmarried, as seen in table 4 'being under obligation' to their male partner who had been helpful to them in some way, or 'being engaged' before they were married, made them more prone. Seven women claimed that the IUDs were expelled. The pathological or the mentally ill women had abortions repeatedly and their psychiatric evaluation was done.

Out of 148 MTPs in 68 married women, only 12 per cent and out of 70 unmarried's only 20 per cent came in second trimester (table 5). A larger proportion seem to come early in first trimester for their second MTPs. Proportionately, a large number of women visited a general hospital for second and third MTPs, whereas for the first MTP they had been to a private clinic (table 6).

The reasons for MTPs are shown in table 7. Spacing seemed to be the common reason for the married women, whereas social stigma was a strong reason for the unmarried's.

TABLE 2  
AGE AND REACTION TO MENARCHE

| Age at Menarche<br>(Years) | Married  |          | Unmarried |          |
|----------------------------|----------|----------|-----------|----------|
|                            | Positive | Negative | Positive  | Negative |
| 11                         | 1        | 1        | 2         | 1        |
| 12                         | 6        | 12       | 1         | 3        |
| 13                         | 6        | 5        | 4         | 4        |
| 14                         | 9        | 14       | 4         | 8        |
|                            | 1        | 1        |           | -        |
| 16                         | 2        | 4        | 3         | 2        |
| 17                         | 1        | 5        |           | -        |
| Total                      | 26       | 42       | 14        | 18       |

TABLE 3

| Reason                   | REASON FOR<br>PREGNANCY<br>1st MTP | AMONG<br>2nd MTP | MARRIEDS<br>3rd MTP | 4th MTP |
|--------------------------|------------------------------------|------------------|---------------------|---------|
| Irregular use of         |                                    |                  |                     |         |
| contraception/failure of |                                    |                  |                     |         |
| contraception            | 64                                 | 59               | 10                  | 2       |
| No contraception         | 3                                  | 1                | -                   | -       |
| IUD expelled             | -                                  | 7                | -                   | -       |
| Planning Pregnancy       | -                                  | 1                | -                   | -       |
| Sex detection            | 1                                  | -                | -                   | -       |
| Total                    | 68                                 | 68               | 10                  | 2       |

TABLE 4

| Reason                         | REASON FOR<br>PREGNANCIES<br>1st MTP | AMONG UNMARRIEDS<br>2nd MTP | 3rd MTP | 4th MTP |
|--------------------------------|--------------------------------------|-----------------------------|---------|---------|
| Under obligation               | 12                                   | 8                           | 1       | -       |
| Incest                         | 1                                    | -                           | -       | -       |
| Pathological                   | 4                                    | 4                           | 4       | -       |
| Mentally ill                   | 1                                    | 1                           | -       | -       |
| Engaged                        | 8                                    | 8                           | -       | -       |
| Irregular use of contraception | 4                                    | 9                           | 1       | -       |
| Paid for                       | 2                                    | 2                           | -       | -       |
| Total                          | 32                                   | 32                          | 6       | -       |

TABLE 5

## FIRST AND SECOND TRIMESTER ABORTION ACCORDING TO MARITAL STATUS

| Married          | 1st MTP | 2nd MTP | 3rd MTP | 4th MTP | Total     |
|------------------|---------|---------|---------|---------|-----------|
| First Trimester  | 58      | 61      | 9       | 2       | 130 (88%) |
| Second Trimester | 10      | 7       | 1       | -       | 18 (12%)  |
| Total            | 68      | 68      | 10      | 2       | 148       |
| Unmarried        |         |         |         |         |           |
| First Trimester  | 17      | 28      | 5       | -       | 50 (71%)  |
| Second Trimester | 15      | 4       | 1       | -       | 20 (29%)  |
| Total            | 32      | 32      | 6       |         | 70        |

TABLE 6

## PLACE OF MTP ACCORDING TO NUMBER OF MTPs

| Place          | 1st MTP | 2nd MTP | 3rd MTP | 4th MTP | Total     |
|----------------|---------|---------|---------|---------|-----------|
| KEM Hospital   | 54      | 89      | 16      | 2       | 161 (74%) |
| Other Hospital | 26      | 7       | -       | -       | 33(14.5%) |
| Private Clinic | 20      | 4       | -       | -       | 24(11.5%) |
| Total          | 100     | 100     | 16      | 2       | 218       |

TABLE 7

## REASON FOR MTP

| Married                 | 1st MTP | 2nd MTP | 3rd MTP | 4th MTP | Total |
|-------------------------|---------|---------|---------|---------|-------|
| Socio-economic          | 14      | 12      | 2       | 2       | 30    |
| Social Stigma           | 3       | 2       | -       |         | 5     |
| Not compromising career | 1       | 3       | 1       |         | 5     |
| Social Reasons          | 1       | 2       | 1       |         | 4     |
| Spacing                 | 45      | 48      | 6       |         | 99    |
| Medical Reasons         | 4       | 1       | -       |         | 5     |
| Total                   | 66      | 68      | 10      | 2       | 148   |
| Unmarried               |         |         |         |         |       |
| Social Stigma           | 24      | 23      | 5       |         | 52    |
| Compromising career     | 6       |         | -       |         | 14    |
| Medical Reasons         | 2       | 8       | 1       |         | 4     |
| Total                   | 32      | 31      | 6       |         | 70    |

A majority of married women had informed their husbands about their decision to abort (table 8). Though concerned, they did not mind it much. Husbands who did not definitely want them to continue in the first pregnancy account for 18 per cent whereas 17 per cent husbands did not want them to continue in the second pregnancy. Only a few husbands wanted their spouses to continue, but there did not seem to be any serious discord over it. Both married and unmarried women (65%) made the decision to have MTP as soon as they were examined, but 32 per cent went back to think over and came back after-a considered decision.

MTP is bearable or painless has been found by a majority of women as can be noticed from table 9. About 15 per cent of women, both married and unmarried found the

TABLE 8  
HUSBAND'S KNOWLEDGE AND REACTION TO PREGNANCY

| Husband's knowledge<br>and Reaction | 1st MTP | 2nd MTP | 3rd MTP | 4th MTP |
|-------------------------------------|---------|---------|---------|---------|
| Husband informed                    | 66      | 64      | 8       | -       |
| Reaction concerned/worried          | 49      | 51      |         | -       |
| Did not want to continue            | 12      | 11      | -       | -       |
| Wanted to continue                  | 3       |         | -       | -       |
| Indifferent                         | 2       | 1       | -       | 2       |
| Did not inform husband              | 2       | 4       | 2       | -       |
| Total                               | 134     | 132     | 18      | 2       |

TABLE 9  
PHYSICAL REACTION TO MTP (IMMEDIATE) ACCORDING TO MARITAL STATUS

| Reaction      | Married |         |         |          | Unmarried |         |         |          |
|---------------|---------|---------|---------|----------|-----------|---------|---------|----------|
|               | 1st MTP | 2nd MTP | 3rd MIT | 4 th MTP | 1st MTP   | 2nd MTP | 3rd MTP | 4 th MIP |
| Painful       | 19      | 15      | 16      | -        | 6         | 9       | 2       | -        |
| Bearable      | 24      | 30      | 1       | 2        | 20        | 19      | 4       | -        |
| Uncomfortable |         | -       | -       | -        | -         | -       | -       | -        |
| Painless      | 24      | 23      | 3       | -        | 6         | 4       | -       | -        |
| Total         | 68      | 68      | 20      | 2        | 32        | 32      | 6       | -        |

procedure of MTP painful but the incidence of this reaction remains the same in second and third MTPs. Both the married and unmarried had a lot of anxiety related to the procedure of MTP. Feelings of regret, sadness, loss were observed in these women, but these feelings were very short-lived.

When interviewed after 20 days, a majority of married and unmarried women felt relieved after MTP, as table 10 shows but a small percentage felt sorry, guilty or repentant.

Thirty-four MTPs were repeated within a year, 32 within 2 years and 42 after 2 years, as shown in table 11.

The use of various contraceptives before and after MTP by the respondents is shown in table 11. A large number of women were made to accept IUDs and a few accepted oral pills, injections, and three were sterilized. With repeat MTPs, they were motivated by the staff to accept contraception. Yet, there is a significant number who refused contraception even after first MTP or repeat MTPs. For example, a nulliparous married woman seeking MTP for the first time did not know exactly why she was undergoing it, but was very sure she wanted it. She did not want any contraception herself and relied on her husband to take care of it. One of the unmarried girls had her first MTP because of social stigma. When she was married, she contracted V.D. from her husband and had to undergo her second MTP. When she was pregnant again, she had jaundice and underwent MTP for medical reasons.

### ***Discussion***

A woman may allow herself to be impregnated in a totally unplanned way because she may be ignorant of contraceptives or the end result of sex. But on considering the total circumstances she would not like to continue that pregnancy. For her, abortion comes as a solace, as an after-thought or a way to correct her inadvertent behavior, when she thinks of it in a more responsible way. Abortion is like a remedy for a catastrophe that has already taken place. This indicates a great need for counseling as there is utter irresponsibility sometimes related to sex, even among the unmarried's. Instead of feeling frustrated at the sight of a patient who comes for repeat MTP; she can be given an insight into her own behavior. For the important thing to bear in mind is that



TABLE  
LATER PSYCHOLOGICAL REACTION TO MTP AND MARITAL

| Marital Status | Married |         |         |                     | Unmarried |         |         |         |
|----------------|---------|---------|---------|---------------------|-----------|---------|---------|---------|
|                | 1st MTP | 2nd MTP | 3rd MTP | 4 <sup>th</sup> MTP | 1st MTP   | 2nd MTP | 3rd MTP | 4th MTP |
| Relieved       | 60      | 62      | 6       | -                   | 25        | 16      | 3       | -       |
| Felt sorry     | 5       | 6       | 3       | -                   | 1         |         | 2       | 4       |
| Guilty         | 3       | -       | -       | -                   | 4         |         | 1       | 9       |
| Repentant      | -       |         | 1       | 2                   | 2         | 3       | -       | -       |
| Total          | 68      | 68      | 10      | 2                   | 32        | 32      | 6       | -       |

TABLE 11  
TIME INTERVAL BETWEEN MTPs

| Months          | 3 | 3-6 | 6-12 | 12-24 | More than 24 | Total |
|-----------------|---|-----|------|-------|--------------|-------|
| 1st and 2nd MTP | 3 | 10  | 21   | 30    | 36           | 100   |
| 2nd and 3rd MTP | - | 5   | 4    | 2     | 5            | 16    |
| 3rd and 4th MTP | - | -   | 1    | -     | 1            | 2     |
| Total           | 3 | 15  | 26   | 32    | 42           | 118   |

TABLE 12  
USE OF CONTRACEPTIVE BEFORE AND AFTER MTP

| Contraception | Before 1st MTP | After 1st MTP | After 2nd MTP | After 3rd MTP | After 4th MTP |
|---------------|----------------|---------------|---------------|---------------|---------------|
| None          | 67             | 56            | 18            | 14            | -             |
| IUCD          | 6              | 24            | 64            | 2             | 1             |
| Oral Pills    | 14             | 15            | 8             | -             | -             |
| Injectable    | -              | -             | 7             | -             | -             |
| Vasectomy-    |                |               | -             | -             | 1             |
| Condom        | 13             | 5             | -             | -             | -             |
| Total         | 100            | 100           | 97            | 16            | 2             |

an unintended pregnancy is a dilemma which a woman or a couple must resolve to cope up with the stress in their lives. Poor education, teenage seem to aggravate the problem. But these young people also need the other equally important form of service such as sex and family life education.

The social and financial pressures due to urbanization are rising day-by-day, with the result that the women have to manage housework and jobs outside. In general, low income couples are less successful users of contraception; therefore, abortion is relatively more helpful to them In maintaining the desired family size<sup>2</sup>.

Till recent past, the event of girls getting menarche, used to be celebrated among certain communities. Today, the mothers themselves are not well informed and hardly seem to find time for explaining it. The neglect of such an important event in their daughter's life can lead the young girls to have a negative reaction to menarche, which can affect their personalities and later on their sex lives.

Among the reasons for pregnancies that were terminated, a majority of women had put the blame on failure of contraception. It Is probable that they may not be using anything or may be using the contraceptives irregularly. But they thought that abortion service will be easily available to them, if they mentioned that their pregnancies were due to failure of contraception. The engaged girls seem to constitute a high risk group. Some of the girls or boys used contraceptives but very irregularly. Most of these girls felt shy to broach the subject and were persuaded by their male partner that there would be no harm in one or two exposures.

One unmarried girl was mentally ill with psychopathic tendencies and was taking treatment from the psychiatric department of the KF.M Hospital. Though abortion helped in relieving her problems as -also those of the pathological personality girls, *they* developed similar type of problems, a few months later, v/hiu!<sup>1</sup> proves the compulsive nature of their repeated pregnancies. They seemed to be predisposed to immaturity and emotional instability through personality characteristics and found some kind of fulfillment in the illegitimate pregnancies.

A small profile can be made up of girls who were interviewed. Most of these girls came from a poor family background. Their parents were not staying together due to death, separation or work in a far off place. Some had severe handicaps like father being a drunkard or not employed or severely incapacitated. Sometimes, the mother was too demanding or full of conflicts herself. The severity of relationship between them left the girls with no ideal parental figures whom to emulate. A few of these girls were submerged in feelings of inferiority. These and the less intelligent ones fell an easy prey to their male partners who could lure them under the false pretext of tenderness and love.

There may be some psychiatric sequelae following a legal abortion, the severity of which is difficult to assess because women who develop such problems may hardly come back and report them. But, it will be a good practice to discuss any conflicts that may arise in relation to an abortion with a social worker or a doctor, to avoid guilt feelings. Sometimes due to the social setting or apprehensive adults, abortion does give rise to such problems, but It is to be hoped that these women recover with the lapse of time.

The women in this study are from a less educated and poorer society. They face the problems of ignorance and inability to take quick decisions; Lack of awareness of MTP facilities cannot be a contributory factor as they have already undergone MTPs and know about the related problems. Indifference and inertia seem to make them sometimes tardy in seeking MTPs, which leads to adverse after-effects.

In the case of unmarried, irregular periods often leads to late awareness of their problem coupled with the difficulty of communicating it to reproving adults, who must accompany them to hospitals to give consent as guardians. Sometimes, the girls purposely delay their visits to a doctor because they feel that they can win over their male partners, who will be forced to marry them.

It may be that the familiar surroundings increase the value of the service given. This is why our patients come back to us for repeat MTPs or it may be that they could not afford to go out. With experience, the women come to know about the free and satisfactory facilities in general hospitals.

Forty to fifty per cent pregnancies end in abortion, which is a common and known practice of fertility control in all societies. Though less dangerous than child birth, the rate of complications - physical and psychological trauma, rises when abortion is performed in the second trimester. Of course, it also depends on a particular society to make the experience more traumatic or negligible; *e.g.* in the Indian society, the social stigma attached to out-of-wedlock pregnancies gives rise to a lot of anxiety and guilt feelings. Still, any patient undergoing an abortion, with the best of facilities, is exposed to some risk with regard to her future fertility. She may become infertile due to pelvic infection or she may undergo spontaneous abortions or pre-mature labor in her future pregnancies which, in turn, may lead to prenatal mortality. The incidence of ectopic gestation is also known to have increased in Japan and Great Britain after the abortion act was legalized.

Any nulliparous woman, therefore, has to be warned about all these risks, when she comes to the clinic seeking abortion.

A significant number of women have found the immediate reaction to MTP bearable or painless. It may reflect their attitude - they wanted MTPs so badly that pain due to procedure hardly mattered. More have felt relieved after the MTPs than anything else. The psychological after-effects of an abortion on a normally well-balanced person are not very significant as many studies have shown<sup>2</sup>. Except for anxiety and depression related to the procedure itself, these women seemed to benefit at least symptomatically.

Each case of repeat MTP needs to be studied over a long period, to see adjustment to MTPs before and after. A long term follow up study will also reveal, if the MTP procedure is truly followed in a large number of cases, problems of menstrual abnormalities, infertility, sterility, poor obstetrical outcome and psycho-social and marital problems.

The married women, in this study wanted abortions for spacing or were not interested in any further additions to the family. They had typical difficulties of housewives due to social, economic and health reasons. It is necessary to persuade these women to accept contraceptive measures or a surgical method of sterilization. Our experience shows that after the MTPs the women are certainly more receptive to family planning advice. The unmarried women also can be introduced to contraception and the fear of injury to body,

sex and community has to be overcome by proper counseling. Awareness regarding availability of abortion facility should be created and its comparative safety, if performed by trained hands in early pregnancy needs to be stressed. Women need to be made to understand that repeat abortions will make them lose their resistance to disease.

This paper is only a small beginning. Much more work is needed to study factors which lead a woman to willfully expose herself to an unwanted pregnancy.

Identification of characteristics of women who come for repeated abortions and profile of women not accepting contraception studied on broader scale will go a long way in identifying these high risk groups, so that appropriate remedial measures can be taken up.

We do not stop cars from running because there are accidents. We admit that there are dangers, but try to minimize them by taking precautions. Similarly, with a careful selection of cases, and improvement in techniques of MTP, supported by contraceptive practice, we will cover a long way in reducing the complications of MTP.

Our present day society is threatened by fertility for which abortion is one of the answers. In a way, it allows the woman to be master of her own body and brings her the joy of bearing 'wanted children'. Unwanted pregnancies will lead to unwanted children for whom society will have to pay dearly over years and generations.

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