

PN-DAQ-020  
157-34646

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**ANALYSIS OF INDIA'S POPULATION POLICIES AND PROGRAMS**

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21 April 1982

A consultative report submitted to USAID/New Delhi by the Population Council. It is based on the authors' visit to India during February, 1982, at the request of USAID/New Delhi. Funds for this work were provided to the Population Council by AID under grant otr-G-1702 and contract DPE-0632 00-1029-00. Drs. Brown, Jain and Laing are with International Programs, The Population Council. Dr. Jansen is with the Policy Development Division, Office of Population, A.I.D., Washington.

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## I. OVERVIEW AND RECOMMENDATIONS

The Population Council has been invited by USAID/New Delhi to review Indian population policy and programs, and to make recommendations to USAID concerning future assistance over the next five to ten years in this sector. This report is intended to contribute to USAID's Multi-Year Population Strategy Statement. The consultant team met with USAID staff, with officials of the Indian Government, Ministry of Health and Family Welfare, the Planning Commission, with state level officials, and with the staff of a large number of public and private sector institutions concerned directly or indirectly with population (see Appendix for a list of people who were contacted).

The two strategic issues for India's population programs are:

- o the need to improve the efficiency and extend the coverage of family planning services including a full range of technologies; and
- o the need to create social and economic conditions conducive to fertility change.

This review starts with the assumption that a wide variety of development factors affect demographic variables, including fertility rates. The response to the problem of population growth therefore requires more than the provision of family planning information and services. Our report analyzes both the family planning program and non-program elements in the Indian development process. It assesses the past and present state of population policies and programs in India, examines program and non-program constraints, and discusses various directions for the future. Finally, it makes recommendations regarding future USAID involvement including the role of other US-based institutions.

## ASSESSMENT OF PAST PERFORMANCE

The population of India has nearly doubled in the 34 years since independence, and now stands at 684 million (or more depending on adjustments to the 1981 census). It is presently growing at 2.2 percent per year. The results of the 1981 census, showing 12 million people more than had been anticipated, provided a stimulus for debate and for renewed commitment, both inside and outside the government, to reducing the growth rate to replacement level by the end of the century.

The past performance in reducing population growth has been uneven and disappointing. Ambitious targets have been steadily revised downward, as measures to slow population growth, concentrating almost entirely on family planning programs, have been less successful than anticipated. The crude birth rate has declined by about 20 percent from 45 in 1951-61 to 35-37 per 1,000 in 1971-81, but concomitant declines in the death rate have resulted in only a trivial decline in the rate of population growth. The numbers of acceptors of sterilization, the principal program method over the past 20 years, have fluctuated widely because of programmatic and political changes.

## PRESENT SITUATION

Our strong overall impression is that there is a renewed political commitment to reducing population growth rates. The national objective of a net reproduction rate of one by the year 2000 is being maintained, despite the 1981 census results. The achievement of that target, according to official estimates, would require almost a tripling of effective contraceptive use, from prevailing rates of 22 percent to 60 percent.

Numerous program and external constraints stand in the way of achieving these ambitious goals. Program constraints include insufficient planning of programmatic inputs and resources required to achieve the objectives; management limitations at all levels of the program; almost total reliance on sterilization, with an extensive use of the camp approach; only partial staffing of the rural health infrastructure; poor quality of training and supervision of rural family planning workers; inadequate informational materials and interpersonal contact; problems of contraceptive manufacture and distribution, as well as an incompletely developed commercial marketing system; and limited use of operations research and evaluation at state and national levels.

The Ministry of Health and Family Welfare (MOHFW) recognizes many of these constraints, and is proposing measures to correct them. It is planning to initiate programs to introduce oral contraceptive distribution throughout the system and to increase IUD use. Strengthened information programs and more effective commercial distribution of condoms and pills are planned. Perhaps most significantly, there is greater political insistence on achieving state and national targets. Despite these efforts and future intentions, it is far from clear that the program will be able to achieve its extremely ambitious goals.

The non-program constraints to the achievement of slower population growth lie at the heart of Indian society and its present state of development. The most salient constraints are: the continued importance of children, especially sons, as a family benefit rather than a cost, and as old age security; continued extremely high infant or child mortality (present IMR 130); high poverty levels (48 percent of the population is below the govern-

ment's nutritional standard); the low status and economic role of women; and low levels of female education and literacy. While the relative importance of these constraints is not known, there is clear evidence that collectively they inhibit demand for family planning and make total reliance on the family planning program a questionable policy choice.

While the Sixth Five Year Plan emphasizes the importance of these factors in maintaining high levels of fertility and calls for improvements in each of them, there are no focused policies, programs, or increases in resources to achieve improvements. Above all, there is no overall coordinated strategy to achieve national demographic objectives, combining plans to improve the underlying factors determining high fertility with plans to satisfy the demand for smaller families through the family planning program. Such a strategy will have to involve a number of sectors, especially education, agriculture, social affairs and rural reconstruction, as well as health and family welfare.

#### DIRECTIONS FOR THE FUTURE

The national family planning program requires substantial strengthening in each of the areas previously cited as constraining the existing effort. With a fully staffed infrastructure, a wider mix of contraceptive methods easily accessible through public and commercial channels, and a sound information and education component, the program would be able to take substantial strides toward achieving national goals.

In addition, a greater involvement of the private sector (both voluntary and commercial) is essential, both to expand coverage and to add greater flexibility and innovation to the government's efforts. Expanded support to

biomedical and operations research is also called for, to provide the technological and operational underpinnings of the program.

While all of these efforts are essential to achieve the government's objectives, we believe that they respond to only a part of the population problem. Until the "beyond family planning" issues are effectively addressed, a rapid reduction in the rate of population growth is unlikely.

"Beyond family planning" activities include legal sanctions, especially raising the age of marriage; tax and welfare benefits and penalties; incentives; social and political organizational approaches; and a restructuring of development policies in key sectors. This last action could lead, for example, to a modification of the policies of the education sector to emphasize primary education through a reallocation of funds from higher education, which presently enjoys a relatively large proportion of overall resources in this sector.

The elaboration of a comprehensive strategic plan is needed, emphasizing targeted efforts by the government as a whole to improve female literacy, decrease infant and child mortality, and expand opportunities for women, as well as to make family planning services fully available. The Planning Commission should take the lead in this effort, which would require a substantial amount of high-quality policy research and analysis undertaken by policy research groups in close collaboration with the government.

#### RECOMMENDATIONS FOR USAID SUPPORT

Throughout our discussions, the need for continued and, if possible, increased USAID support was stressed by Government officials and private

groups. The following areas are seen to be highly significant for the expansion of the Indian population program, consistent with the government policies and priorities, and corresponding to the technical strengths and experience of USAID and supporting US institutions.

1. USAID should seek opportunities to facilitate broad-based, population policy-oriented work leading to improvements in policy formulation, program planning, implementation, and evaluation.

While the Sixth Plan document recognizes various linkages between developmental activities and demographic change, these have to be strengthened and put into practice in sectoral planning. Systematic, policy-oriented work on population and development related issues is required, with Indian institutions and social scientists taking the lead in establishing priorities and undertaking research and analysis. What the future role of USAID in this work might be is not clear because of its sensitivity and because it will not involve a significant transfer of resources. Nevertheless, USAID can play an important role by highlighting the importance of this area in discussions with the Planning Commission and other institutions. USAID can also facilitate the establishment of appropriate mechanisms to support and sponsor research on key issues, and to enhance the utilization of the results.

2. USAID should seek opportunities to strengthen program planning practices at the national and state levels, with special emphasis on low-performance states.

Planning concepts and practices can be introduced in those states where USAID is currently involved through its area program. A successful

introduction in these areas should open up opportunities to introduce planning concepts and practices at the central level and in other states, especially the low-performance states.

3. USAID should support efforts to effectively incorporate reversible contraceptive methods into the program.

USAID should utilize its unique capability to assist the MOHFW in all aspects of its efforts to expand the availability of reversible methods, from production and introduction planning, to delivery at rural levels.

4. USAID should support efforts to expand the Social Marketing Program.

USAID, with its extensive experience in the social marketing of contraceptives, is ideally suited to provide technical assistance to GOI to dramatically increase the role of the Nirodh marketing scheme to distribute condoms and to add orals to the marketing scheme. Careful consideration should be given to the establishment of an autonomous or semi-autonomous management structure, separate from the MOHFW.

5. USAID should support program-related research, especially operations, evaluation for management needs, and safety and acceptability of contraceptives research.

USAID should bring together US-based and Indian operations research agencies to implement the operations research component of its area program. Studies of safety and acceptability of new and existing contraceptives also deserve priority. Support for fellowships in epidemiology for a number of

qualified Indians is recommended. AID should give lower priority to supporting research and development of new contraceptives.

6. USAID should continue overall support to state-level programs and should consider future extension to low-performance states.

While no change in USAID's current support to the area program is recommended, USAID should consider expanding this type of program in the future in regions of low performance and in populous states, for example, Uttar Pradesh and Bihar.

7. USAID should continue to support private voluntary organizations.

While supporting large PVOs, USAID should develop appropriate mechanisms within India to support small PVOs.

8. USAID should support selected information, education, and communications programs, emphasizing information on methods.

USAID should support the creation of materials for illiterate or semi-literate populations, with pictorial and symbolic content, to provide them with practical information on each contraceptive method: how it is used, where it can be obtained, and what its advantages and disadvantages are. Lower priority should be given to traditional IE&C activities to promote the concept of a small family.

## POSSIBLE US PRIVATE SECTOR COLLABORATION

We have examined the potential role of the U.S. private sector as part of US-India collaboration in population. Several opportunities for collaboration are mentioned in the recommendations, especially in the areas of contraceptive manufacture and marketing techniques including media and promotion. A further opportunity lies in the area of exchange between Indian and US business leaders, to explore together population issues as they relate to industry and to examine the appropriate roles for industry. Groups such as the Population Resource Center or Business International in the US could facilitate such an exchange which could include visits and workshops in both countries. The Employers Federation of India has also expressed an interest in such an exchange.

## II. BACKGROUND

We start with the assumption that there are no simple or universally applicable recipes for achieving stated and desirable demographic objectives. Available evidence strongly suggests that any approach that has proven successful in one country may not be feasible to replicate with success in another country. Approaches suitable to local needs and social, economic, and political realities must be found and applied. This requires careful analysis of various alternatives, experimentation and intensive debate. Analysis is required to diagnose the problem, and identify appropriate interventions. Experimentation with selected interventions is needed to determine suitability for wider implementation. Continuous evaluation is essential in order to make adjustments.

It is not the role of external visiting teams like ours to replace this process or to provide prescriptions, but to highlight the importance of the process itself and certain strategic issues.

### RECENT POPULATION SITUATION IN INDIA

The population of India has nearly doubled during the period of 34 years since independence, from 344 million in 1947 to 684 million in 1981. The 1981 Census figures shattered the expectations of a marked decline in growth rate during the 1970s in comparison to the 1960s. The population grew by 24.75 percent between 1971 and 1981, a shade less than the intercensal growth (24.80 percent) of 1961-71. The 1981 Census count was 12 million more than the amount projected for this period and used for the Five Year Plans of 1978-83 and 1980-85. In contrast, the 1971 Census count was 14 million less

than the projected figure. Some observers believe that the 1971 Census had more deficiencies than the 1981 Census. Others believe that the birth rate since the mid-1960s has not declined as markedly as earlier estimates of fertility and mortality trends suggested.

Fertility prior to 1961 was high and remained virtually constant. Different estimates based on the 1951 and 1961 Census data vary between 42 and 48 per 1,000 population. However, there seems to be some consensus among researchers that the average birth rate for this period was about 45. For 1961-71, the estimates of average birth rate vary between 40 and 42. These estimates imply that the birth rate between 1951-61 and 1961-71 declined by 3-5 points (7-11 percent), though there is enough room for error given the range of estimated birth rates for the 1951-61 period. The picture during the 1970s, however, is not clear.

The age distribution from the 1981 Census required to estimate the average birth rate for 1971-81 is not yet available. The estimates based on the Sample Registration System (SRS) of the Registrar General show that the birth rate declined from 36.8 in 1970 to 33.2 in 1978, that is, by about 10 percent. However, estimates from two surveys conducted by the Registrar General's office show that the total fertility rate (TFR) declined by 20 percent in rural areas, and by 18 percent in urban areas between 1972 and 1978. The SRS estimates of birth rate for the early 1970s, according to some researchers, may be underestimated by as much as 8 percent. The degree of underestimation in birth rates for the late 1970s is not known. An average annual death rate of about 15 and an average annual growth rate of 2.2 percent would imply a birth rate of about 37 for the mid-point of the 1971-81 decade. It would further imply a decline in birth rate between 1961-71 and 1971-81 in

the order of 3-5 points. It is quite plausible that the decline in birth rate estimated between 1951-61 and 1961-71 continued during the 1970s. If so, the decline in birth rate during the 1970s at least compensated for the decline in death rate during this period and arrested the increase in the average annual growth rate from one decade to the next as observed since 1921.

The rates of population growth vary substantially in different regions and states in India. Among 14 states with a population of at least six million, excluding Assam, total growth between the 1971 and 1981 Censuses ranged from a low of 17.2 percent in Tamil Nadu to a high of 32.4 percent in Rajasthan. The most populous state of Uttar Pradesh, with about 111 million people in 1981, grew by 25.5 percent during the 1970s in comparison to 19.8 percent during the 1960s. The state of Kerala, on the other hand, with about 25 million people in 1981, grew by 19 percent during the 1970s. Eight states showed a decline in intercensal growth for 1971-81 in comparison to 1961-71: Tamil Nadu, Kerala, Orissa, Gujarat, Haryana, Madhya Pradesh, Maharashtra, and West Bengal. The intercensal growth went up in the remaining six states: Andhra Pradesh, Bihar, Karnataka, Punjab, Rajasthan, and Uttar Pradesh. These six states contained nearly half (47 percent) of the country's population in 1981. The extent to which these different patterns of population growth are due to differences in fertility, mortality, interstate migration, or differences in underenumeration in Censuses cannot be ascertained at this time.

#### POPULATION POLICY

Beginning in the early 1950s, India's planners and administrators have recognized the need to slow down the country's population growth rate. The

rapid increase in population, in the framework for the Sixth Plan, is seen as a "continuing drag on the resources of the country." A consensus above partisan politics has now emerged following the 1981 Census results as endorsed in a statement signed in May 1981 by over 80 prominent citizens of the country, including representatives of all major political parties except the two Communist parties.

The rate of population growth has three components: fertility (birth rate), mortality (death rate), and migration (in-migration and out-migration). At the national level, the contribution of migration to the rate of population growth has been and will continue to be negligible. The death rate has declined from 47 in the 1920s to about 15 in the 1970s. There is considerable potential for a further decrease in mortality, which will increase the rate of population growth in the short run. A sustained reduction in the rate of population growth can be achieved only through a reduction of the birth rate -- the third component of the growth rate. The reduction in birth rate, however, has to be greater than the reduction in death rate for the population growth rate to decline.

India became the first country to adopt an antinatalist policy in 1952 -- thirty years ago. Since then, ambitious targets of reduction in the birth rate have been set and continuously revised downwards or postponed. The early ambition, as expressed in the First Five Year Plan (1954-59), was "to achieve a reduction in the birth rate to the extent necessary to stabilize the population at a level consistent with the requirement of the national economy." The demographic targets were quantified in 1962 "to reduce the birth rate in India to 25 births per 1,000 population by 1973." This goal was revised in 1969 by the Planning Commission, which set a target of achieving a crude birth rate of

32 by the end of the Fourth Plan (1974) and a birth rate of 25 to be realized six to eight years later. The Fifth Plan (1974-79) estimated an average crude birth rate of 30 during 1976-81 and set the goal of 25 during 1981-86. In 1978, the achievement of a birth rate of 30 was again postponed by another five years to 1983.

Reflecting the May 1980 report of the Working Group on Population Policy, India's long-range objective set forth in the Sixth Five Year Plan for 1980-85 is to reduce "the net reproduction rate (NRR) to one by 1996 for the country as a whole and by 2001 in all the States." A target of replacement fertility for the country as a whole by 1996 implies that the fertility would be below the replacement level for many States. The goals in terms of fertility and mortality are a birth rate of 21 and death rate of 9 per 1,000 population for the country as a whole.

The organization of a national Family Welfare (Planning) Program has been the major program intervention to achieve the demographic targets set forth since 1952. The objective of achieving a level of birth rate is translated into method-specific targets. The Sixth Plan envisaged 22 million sterilizations and 7.9 million IUD insertions, and a level of 11 million equivalent users of conventional contraceptives (Nirodh) and oral pills by 1984/85. In terms of percentage of couples effectively protected, the Sixth Plan envisaged an increase from 23 percent in 1979/80 to 36 percent in 1984/85, and to 60 percent by the end of the century.

Other elements of strategy to achieve the national demographic objectives in the Sixth Plan include the following:

The Sixth Plan recognizes "that economic development can in the long run bring about a fall in fertility rate," but discards it as an option on the

grounds that "developing countries with large populations cannot afford to wait for development to bring about a change in the attitudes of couples to limit the size of families as the process of development itself is stifled by population growth."

The Sixth Plan recognizes that "family planning cannot be the sole responsibility of any one Department but of Government as a whole." The necessity of "an integrated approach to the problem of public health and proper coordination of activities of different departments having a bearing on family planning such as maternal and child care" is also noted in the Plan.

"The role of education, specially female education, in reducing fertility" is recognized but stress has been laid on "increasing the enrollment in the high schools and minimizing dropouts," rather than on improvements in primary school education.

The role of delayed marriages in achieving smaller family size is emphasized. Legislation to fix the minimum age of marriage at 21 years for boys and 18 years for girls was enacted in March, 1978. The Sixth Plan notes that in addition to the enforcement of this law, "social pressures of the community against early marriages should be built up by appropriate means."

The Medical Termination of Pregnancy (MTP) Act was passed in April 1971, as a health measure. The Plan, however, mentions that "MTP can be resorted to as a corrective method for failure of contraceptives," and that "the existence of this Act and the benefits that can be derived . . . need widest publicity."

### III. ANALYTICAL FRAMEWORK AND ORGANIZATION OF THE EFFORT

#### ANALYTICAL FRAMEWORK

Couples do not live in isolation and therefore their reproductive behavior is influenced not only by biological factors, but also by the environment in which they live. In the absence of any biological constraints and those imposed by the social, cultural, and physical environment, couples on the average are capable of producing close to 15 children during the entire reproductive period of about 30 years while the females are between the ages of 15 and 45 years. The actual realization of this biological capacity is rare but is not non-existent. For example, a survey of the members of the Seventh Lok Sabha in India shows that three out of 544 members have as many as 11 children. The total fertility in India prior to the family planning program, however, had been about six live births per couple, on the average. Recognizing some variation around the mean, it is obvious that reproductive behavior of Indian couples has been nowhere close to their biological capacity. Even in the absence of organized family planning program intervention, society has instituted various constraints on the reproductive behavior of couples which have been operating successfully for a long time. Most prominent among them is the practice of almost universal and prolonged breastfeeding. Others include such practices as separation between spouses; abstinence from sexual intercourse following childbirth, on religious grounds, and upon becoming a grandparent; and a high incidence of widowhood and low incidence of remarriage. The extent of changes in these forces which traditionally suppressed fertility is not known, but that changes have been occurring and will continue to occur is evident. That the loosening up of these traditional con-

straints creates an upward pressure on actual reproduction is also clear. There is also consensus that factors which can counteract this upward pressure and eventually set the downward trend in motion include late marriages, use of contraception, sterilization and induced abortions. The fertility level at a point in time and changes over time in a society thus depend upon what happens to the four most important proximate determinants: marriage patterns; the prevalence and duration of breastfeeding; the use of contraception, including abstinence and sterilization; and the prevalence of induced abortions. These four factors have been shown to account for most of the fertility differences between societies.

Recognizing the potential positive influences on birth rate of decreases in widowhood and breastfeeding, measures to decrease the birth rate will have to concentrate on raising the age at marriage and increasing the use of contraception, sterilization and induced abortions. There is very little disagreement on this point except that the potential positive influences on the birth rate have not received adequate attention in India.

Major disagreements in the field have focused upon the identification and implementation of measures to increase the use of contraception, sterilization, and induced abortions. The low level of contraceptive use is usually attributed to lack of demand or to lack of supplies, but there are major disagreements about their relative roles. At the one extreme, the argument is: when couples really want to control their fertility, they can do it, because they have done it by using such methods as abstinence. The argument at the other extreme is: there is enough demand, as demonstrated by various surveys, and what is lacking is the supply of contraceptive methods. Moreover, adequate supply will also generate demand. The truth, perhaps, lies between these two

extremes. In India, demand far exceeds the supply of most of the commodities or services provided by the Government. That does not appear to be the case for adopting contraceptive methods even when services are available, however. There are some exceptions as noted later on. Since the birth rate has not declined to the extent projected, it will be useful to assume that a substantial increase in the use of contraception would require simultaneous efforts to decrease the demand for children and to improve the accessibility of appropriate fertility regulation methods.

In sum, two overarching factors that determine the levels of the four proximate determinants of fertility, and levels of fertility itself, include: a) the accessibility to services and information about various fertility regulation methods, and b) the demand for children and the role they play in the society and the survival of the family. This provides a general framework for the analysis and description that follows.

#### ORGANIZATION OF THE REPORT

The remainder of the report is divided into five main sections. Sections IV and V deal with the family welfare program description and performance, respectively. Section VI describes program and external constraints. Directions for the future in terms of program implementation, research, and beyond family planning measures are described in Section VII. The last section, VIII, describes opportunities for involvement of both USAID and other US organizations.

#### IV. THE FAMILY WELFARE PROGRAM

##### STRUCTURE

The Ministry of Health and Family Welfare has overall responsibility for family planning, but other ministries are concerned with various aspects of the family planning program, and the states have responsibility for implementing programs. The Ministry of Information and Broadcasting carries out much of the media program, including radio and films. The Ministries of Education and Social Welfare, of Labour, and of Agriculture are also involved. The Ministries of Railways, Labour, Defence, and Posts and Telegraphs, which have large blocks of laborers, provide their own family planning services.

Within the Ministry of Health and Family Welfare, the responsible department is that of Family Welfare. It is broken down into divisions for policy, technical matters, information, sectors such as industries and railroads, and evaluation. There are 16 regional Directors of Health and Family Welfare in the major states, who act as liaison with state health officers. The state health structures are similar to that of the national level, each having a State Health and Family Welfare Department.

At the district level within the states, District Health and Family Welfare officers carry out family planning responsibilities. Urban areas have official family planning centers. In rural areas, family planning activities are carried out by primary health centers (PHCs), each of which serves an average population of about 100,000. It is planned that the number of PHCs will be increased to one for every 30,000 persons. PHC doctors are usually men. Women are usually treated by an auxiliary nurse-midwife (ANM) or other female paramedical worker except in cases requiring the intervention of a

physician, such as sterilization, IUD insertion and medical termination of pregnancy (MTP).

Under each PHC, there are several subcenters, each staffed by one ANM and one male multipurpose worker. Currently there are about 50,000 rural subcenters, each serving an average of about 10,000 persons. Efforts are being made to reduce the ratio to one subcenter per 5,000 persons.

In late 1977, a program to train part-time, village-based volunteer health workers began. Originally called Community Health Workers, then Community Health Volunteers, they are now known as Village Health Guides (VHGs). The VHGs are selected by the village panchayats and given three months' training to enable them to provide rudimentary health services and family planning information and assistance. Also at the village level, traditional birth attendants (dais) receive training in maternal health care, including family planning; about 200,000 VHGs and 300,000 dais have been trained to date. The plan is to have one trained VHG in each village (or in larger villages, one per 1,000 persons) by 1985 and one trained dai per village shortly thereafter.

## SERVICES

The program offers male and female sterilization through hospitals, urban and rural health centers, and special "camps" which bring services to areas where they are not ordinarily available. The camps held in recent years have been at a somewhat smaller scale than the well-known mass sterilization camps (mostly for vasectomy) conducted in the early 1970s.

IUD insertions are offered at hospitals and health centers as well as at subcenters, where most ANMs have been trained in IUD insertion. Until

recently, only the Lippes Loop was available, but in the past three years the Copper-T has played an increasingly important role. The demand for the Copper-T appears to be high, but local manufacture has not yet begun and demand has outrun supplies in some areas. Copper-T insertion is generally available at hospitals and health centers, but not yet at subcenters.

Oral pills have always been available through the program at some centers, but until 1979 they were available almost exclusively in urban areas. In March 1979, an order was issued to the state ministries authorizing prescription of low-dose pills by ANMs subject to approval of a physician within three months. However, the availability is still limited and the demand is low at present.

Condoms have been manufactured in India since the early 1960s and distributed by a program under the name Nirodh. They are available at all levels of program operations, from hospitals down to the VHGs. In addition, since 1968, Nirodh have been marketed commercially, at subsidized prices, through an arrangement between the MOHFW and several commercial marketing firms.

Abortion, officially designated as medical termination of pregnancy (MTP), is legal if performed by a specially trained doctor in an authorized medical establishment. Its availability tends to be limited to urban areas.

#### SUPPORT SYSTEMS

The Department of Family Welfare in the Ministry of Health and Family Welfare and its equivalent bureaus in the states carry on a program to educate the general public, particularly married couples, on the necessity and desir-

ability of practicing family planning and accepting the small family norm. The current information, education, and communication program includes efforts to increase community involvement in support of the family welfare program by means of orientation training camps for local opinion leaders, held at the subcenter level; production and broadcasting of radio programs; and production and dissemination of printed matter for program personnel and eligible couples. Other types of audiovisual materials are produced as well, such as posters, billboards, newspaper advertisements, and filmstrips. With the launch of a communications satellite in April 1982, there is much more potential for increased use of television.

Workers at all levels receive initial training in family planning methods. Medical and paramedical workers are supposed to receive periodic retraining, but the degree to which this principle is implemented varies considerably from place to place. Village workers -- dais and VHGs -- currently receive no in-service training. Continuing support is expected to be provided through supervision. Male multipurpose workers are responsible for supervising male VHGs and subcenter ANMs are responsible for supervising dais and female VHGs. The subcenter ANMs are in turn supervised by higher-level paramedical workers, who are supervised by the PHC doctors, and so forth.

Research and evaluation in connection with the family planning program are administered by the MOHFW, at the central level by the Evaluation and Intelligence Division and at the state level by Demographic and Evaluation Cells. The routine collection of data on family planning acceptors and supply distribution is conducted by aggregating figures from lower levels and submitting them to the next higher level for further aggregation. The system is very well organized, and data on the number of sterilizations and IUD inser-

tions during a month are usually available at the central level within two or three weeks after the end of the month. Complete reporting on oral pills and condoms takes three to four weeks longer, owing to the greater difficulty of collecting and aggregating village-level data.

Most program-related research is conducted either in-house by research personnel at the state and district level or by salaried personnel at a network of population research centers (PRCs) financed by the MOHFW. The studies conducted by the state ministries and PRCs tend to be relatively small in scale and simple in design, owing to limited staff size and capability. Some larger and more sophisticated studies are undertaken through better developed government and private research institutions.

#### RESOURCES: GOVERNMENT AND DONOR INPUTS

##### Government Support

Since 1952, when India established its national family planning program, the program has received significant and increasing support. The family planning program in India is centrally funded and the total government allocations, from the First Five Year Plan through the Sixth (1951-1985), amount to over Rs. 27 billion (See Table 1).

The First Five Year Plan (1951-56) called for an allocation of Rs. 6.5 million; but, by the Fourth Plan (1969-74), allocations for family planning had reached Rs. 3,150 million. There was an absolute increase in allocations of about 58 percent between the Fourth and Fifth Plans. However, if one allows for inflation, the relative expenditures for family planning during the Fifth Plan were almost the same as those during the Fourth Plan. Under the current Sixth Plan (1980-85), the government has allocated over Rs. 10

TABLE 1: BUDGET OUTLAY AND ACTUAL EXPENDITURE  
ON FAMILY PLANNING: 1951-56 TO 1980-85

| Five-Year Plan Period      | All Developmental Activities (millions Rs.) | Family Planning (millions Rs.) | Family Planning as % of Total Development Outlays | Actual Expenditure on Family Planning (millions Rs.) |
|----------------------------|---|--------------------------------|---|--|
| First 1951-56              | 23,560                                      | 6.50                           | 0.03  | 1.45   |
| Second 1956-61             | 48,000                                      | 49.70                          | 0.10  | 21.66  |
| Third 1961-66              | 75,000                                      | 269.76                         | 0.36  | 248.60   |
| Annual 1966-69             | 67,565                                      | 829.30                         | 1.23  | 704.64   |
| Fourth 1969-74             | 159,020                                     | 3,150.00                       | 1.98  | 2,800.40   |
| Fifth 1974-79              | 393,220                                     | 4,970.00                       | 1.26  | 4,090.00 <sup>a</sup>                                |
| Sixth 1978-83 <sup>b</sup> | 710,000                                     | 7,650.00                       | 1.08  | -  |
| Sixth 1980-85 <sup>c</sup> | 975,000                                     | 10,100.00                      | 1.04  | -  |

Sources: Ministry of Health and Family Welfare, Family Welfare Programme in India: Year Book 1979-80, New Delhi (1981), Page 4; and various documents of the Planning Commission; as quoted in Visaria, Pravin, and Leela Visaria, "India's Population: Second and Growing," Population Bulletin, 6:4 (1981).

a. Provisional Estimates

b. From draft, Sixth Five Year Plan, prepared before January 1980 elections.

c. From Sixth Five Year Plan, prepared after January 1980 elections.

billion. This works out to be a little over Rs. 18 per couple per year. The current budget, after discounting for inflation, represents a relative increase of over 25 percent. However, it represents only one percent of funds allocated for all developmental activities in comparison to two percent allocated in the Fourth Plan.

### External Support

International donors have provided support to population activities in India for several years. For example, in the five years preceding the Sixth Five Year Plan, external assistance to the Family Welfare Programme totaled slightly more than \$100 million. The external assistance, however, represented only about 18-19 percent of the total budget for the same period. Similarly, in the current Sixth Five Year Plan (1981-86) external assistance will again constitute around 19 percent of the total budget and will amount to about \$205 million.

Figures on per capita expenditure and the extent of external support for family planning are not exactly comparable across countries because of differences in purchasing power of dollar equivalents in local currency in different countries. However, a broad picture can be visualized by comparing these figures shown in Table 2 for selected countries in the region. Both in India and the Philippines, about 23 percent of the funds for family planning in 1978/79 were provided by external agencies in comparison to 33 percent in Indonesia and over 50 percent in Pakistan, Thailand, and Bangladesh.

The per capita annual expenditure on family planning in US cents in India (20) was higher than in Thailand (16) and in Bangladesh (18); but was lower than Pakistan (24), Indonesia (29), the Philippines (51), and Malaysia

TABLE 2: PER CAPITA FUNDS FOR FAMILY PLANNING PROGRAMS AND PERCENT MET FROM EXTERNAL RESOURCES FOR SELECTED COUNTRIES IN THE SOUTH AND EAST ASIA REGION

| Country               | External Support as % of Total Funds | Annual Per Capita Budget in US Cents |             |
|-----------------------|--------------------------------------|--------------------------------------|-------------|
|                       |                                      | Government                           | All Sources |
| Bangladesh (1976/77)  | 64                                   | 6                                    | 18          |
| India (1978/79)       | 23                                   | 16                                   | 20          |
| Indonesia (1978/79)   | 33                                   | 19                                   | 29          |
| Malaysia (1978/79)    | u                                    | 65                                   | 68          |
| Pakistan (1976/77)    | 50                                   | 11                                   | 24          |
| Philippines (1978/79) | 23                                   | 38                                   | 51          |
| Thailand (1978/79)    | 52                                   | 7.5                                  | 15.8        |

Sources: Nortman, Dorothy L., and Ellen Hofstatter. "Population and Family Planning Programs, 10th Edition," Population Council, New York, 1980.

u.= Unavailable.

Notes: All sources also include private organizations. For Thailand, the domestic budget represents direct monetary input and excludes the contributions of the personnel and facilities of the health network into which the program is integrated.

(68). Due to annual variations, the appropriate level of expenditure on family planning is difficult to ascertain from these numbers. However, if the level in India were to increase to the level prevalent in the Philippines, the Sixth Five Year Plan budget would have to increase to Rs. 25.75 billion or about 2.64 percent of the budget outlay for all development activities. Assuming the external assistance remains at 19 percent of the total budget, its total value would have to increase to \$523 million from the current level of about \$205 million.

A summary of recent and expected external support to the program follows:

1) The United Nations Fund for Population Activities (UNFPA)

UNFPA has been assisting India's family planning program since 1974 through two five-year programs. Under the first agreement signed in July of 1974, UNFPA provided over \$42 million during the period 1975-79. These funds supported a variety of national level projects including: provision of family planning information, education and training; integration of family planning into the national health system; provision of equipment and contraceptives; and local production of contraceptives.

In June of 1980, a second five-year agreement (1981-86) was negotiated for around \$100 million. Internal resource constraints, however, prompted UNFPA to lower that amount to \$80 million. In addition to continuing support for some of the national-level projects listed above, about 60 percent of the UNFPA assistance is devoted to support of the MOHFW's intensive area program in two states, Bihar and Rajasthan. This program strives to develop infrastructure and local delivery of services to parts of the states where the

literacy rate is very low and conditions are particularly poor. UNFPA is supporting this program in six districts of Bihar (Monghyr, Santhal/Parganas, Saharsa, Katihar, Bhagalpur and Purnea) and three districts of Rajasthan (Kota, Swai-Madhopur and Bharatpur).

During the interim period between the first and second five-year agreement (1980), the UNFPA also provided approximately \$2.8 million to continue its support to the national-level projects.

## 2) The World Bank

The Bank began its first population project in India in 1973. Created in cooperation with the Swedish International Development Authority (SIDA), the project provided over \$31 million for a broad framework of health and family planning services in 12 districts of Uttar Pradesh and Karnataka. It covered building construction, provision of vehicles, other equipment, training facilities and a program evaluation system. The project was completed in May of 1980.

Encouraged by the first project, the Bank embarked on a second similar project in July of 1980 which will total \$40 million. This project provides support within the MOHFW area program to six districts of Uttar Pradesh (Azamgarh, Basti, Deoria, Gazipur, Mirzapur and Varanasi) and to three districts of Andhra Pradesh (Anantapur, Chitoor and Cudappah). Its focus is on lowering infant mortality, improving maternal and child health and decreasing fertility. Over its five-year life, the project will provide buildings, vehicles, equipment, training for a range of personnel, and staff salaries.

3) Overseas Development Administration (ODA) of the U.K.

From 1977 to 1980, ODA provided approximately \$5.5 million to increase and improve sterilization facilities in 1,000 primary health centers and for equipping or building 325 sub-district hospitals. In July of 1980, implementation began for another ODA project, this one under the broader area program of the MOHFW. This project provides about \$20 million over a five-year period to strengthen the rural health and family planning system in five districts (Cuttak, Ganjam, Kalahandi, Phulbani and Puri) of Orissa State.

4) Norwegian Agency for International Development (NORAD)

Between 1973 and 1977, NORAD supported the All India Hospitals Postpartum Program and family planning programs in rural areas with about \$5 million. NORAD, under another agreement for 1977-82, provided a further \$26.5 million for the same program. The funds made available under this agreement were utilized to extend the Post Partum Programme to additional hospitals and medical colleges in the country. Towards this end, the second agreement concentrated on the construction of buildings and postpartum facilities and the payment of salaries for some of the staff.

NORAD entered a third agreement with the government in April of 1981. This current agreement provides nearly \$4 million to expand the postpartum program to 50 subdistrict hospitals.

5) Danish International Development Agency (DANIDA)

DANIDA, from 1973 to 1981, contributed around \$2.4 million for the construction of a complex of buildings for the National Institute of Health and

Family Welfare. An additional \$220 thousand from DANIDA was utilized between 1976 and 1978 to acquire equipment and supplies for the Central Drug Research Institute in Lucknow.

In 1980 and 1981, DANIDA negotiated agreements to support the MOHFW's area program in two States. These agreements call for about \$30 million to be used in eight districts (Sagar, Tikamgarh, Gwalior, Morena, Shivpuri, Guna, Bhind and Datia) of Madhya Pradesh and two districts (Salem and South Arcot) of Tamil Nadu. DANIDA assistance in the area program will extend over a five-year period.

6) Swedish International Development Authority (SIDA)

Between 1973 and 1978, SIDA provided about \$12 million to assist in the supply of contraceptives. SIDA also contributed over \$400,000 from 1978 to 1981 for vitamin "A" capsules in the MCH program. No future support in population is currently being considered.

7) United States Agency for International Development (USAID)

USAID's first population project in India began in late 1967 and extended to 1973. During this time period, nearly \$20 million plus another Rs. 165 million were provided to support a variety of population activities. These funds assisted in the importation and equipment for local production of contraceptives (orals and condoms); the marketing of condoms; a distribution program for orals through 150-200 centers with medical and paramedical staff; the strengthening of five central training institutes and about 60 training centers; the improvement of demographic training and research at a central center for demography; the expansion of mass education and communications pro-

grams through radio, films and mailed literature; the provision of intensive family planning services to around 50 of the most populous districts in the country; biomedical research undertaken at ICMR; and an MCH program in which traditional birth attendants (dais) received training at public health centers.

No assistance in population was given between 1973 and 1980. In 1980, USAID began a new project which will provide \$40 million to strengthen integrated health and family planning services in rural areas. To extend over a five-year period, the project falls under the MUHFW's area program and will assist: two districts (Osmanabad and Parbhani) of Maharashtra State; two districts (Punch Mahal and Bharuch) in Gujarat; three districts (Songroor, Faridkot and Bhatinda) in Punjab; three districts (Kangra, Hamirpur and Sirmur) in Himachal Pradesh; and three districts (Bhiwani, Sirsa and Mahendergarh) in Haryana.

At about the same time, USAID embarked upon another project which will provide around \$20 million worth of rupees for a special grant fund. This fund is to be used by the government to finance rural projects and activities of private institutes and organizations.

In addition, USAID and the government are discussing a third project which could bring up to \$32 million more in population assistance. Areas under discussion for this project include: commercial marketing of contraceptives; mass information, education and communication activities; contraceptive production; and biomedical, program and policy research. Currently, this project is being contemplated to begin sometime in fiscal year 1983.

#### 8) Support by US-based Institutions

Several US-based organizations have been or are involved in population activities in India. Among those funded by AID/Washington, Family Planning International Assistance is providing about \$200,000 to the Christian Medical Association of India for family planning services. The same amount is being extended from PARFR to the Indian Council of Medical Research (ICMR) and the government for biomedical research and training. In 1980 and 1981, JHPIEGO provided assistance to the government for laparoscopes and training in laparoscopy. The Battelle Memorial Institute, under its Population and Development Policy Program, is supporting a program of research and analysis on overcoming obstacles to more effective family planning programs in Uttar Pradesh and Bihar. This program is being undertaken by the Center for Policy Research in New Delhi.

The Population Council, which is partially funded by AID/Washington, is collaborating with professionals in the biomedical field through the International Committee for Contraception Research, and is awarding fellowships in the biomedical and social sciences fields. The Council is providing funds for a research project under its program on the Fertility Impacts of Development, administered through its regional office in Bangkok. In addition, the International Awards Program for Determinants of Fertility Research, administered by the Council's New York office, has received several proposals involving research institutes in India, one of which has been approved to date for funding. The Council has provided technical assistance to the government in setting up manufacturing capacities for the Copper-T 200 intrauterine device and currently distributes its two journals, Studies in Family Planning and Population and Development Review, to more than 700 professionals.

Under the auspices of the Indo-U.S. Subcommittee in Science and Technology, the Science Office of the American Embassy coordinates and monitors a number of scientific research activities related to the prevention of conception. These activities, involving the ICMR and the National Institutes of Health (US), include: collaborative drug testing of contraceptives; the establishment of a reagent bank for biological materials; a workshop on hybridoma technology for research in reproduction; a workshop on nonisotopic assay methodology; and a planned workshop on ovum implantation. The MOHFW, as well, is discussing the possibility of a long-term collaborative relationship with the University of Hawaii and the East-West Center to strengthen the communications support for family planning.

Among US private organizations, the Ford Foundation has provided financial and technical assistance for institutional development and for biomedical and social science research. It has recently given a grant to the Indian Association for the Study of Population. The Rockefeller Foundation is providing support for biomedical research through ICMR. It has also supported a conference organized by ICMR in October 1981.

#### INSTITUTIONAL CAPABILITIES IN INDIA

India possesses a remarkably extensive and varied range of institutions providing family planning services and training, and conducting research. Over 400 private sector organizations offer family planning services, frequently along with other health or community services. The largest of these are the Family Planning Association which offers services for approximately one percent of eligible couples, primarily in urban areas; the Christian Medical Association of India, which provides hospital and clinic-

based services, especially in southern states; the Nutrition Foundation of India; the Indian Hospital Association; and the Voluntary Health Association of India. Many of the smaller PVO's provide family planning as part of well-developed community health and development programs. Several have had remarkable success in lowering fertility and mortality rates, and in maintaining high rates of continued use of a variety of contraceptives, including orals.

There are over 200,000 physicians in India, trained in 116 medical schools. (The government plans no further expansion of schools, and has frozen enrollment at 13,000 per year.) About one-half of the physicians are in private practice, mostly in urban areas. The Indian Medical Association has 52,000 members, 30 percent in small towns and villages. An extensive network of Ayurvedic, Unani and Sidha practitioners also exists, with a large percentage in small towns and villages. There are an estimated 200,000 Ayurvedic and 60,000 Unani practitioners. Some Ayurvedics include allopathic medicine in their practice, and could be providers of family planning services.

In biomedical research, India has a rich network of institutions and highly qualified scientists. The Indian Council of Medical Research coordinates research with 21 Human Reproduction Research Centers throughout the country. The ICMR collaborates with many international research groups, including several supported by USAID. Research includes testing of new contraceptives, safety studies, and acceptability research. The National Institute of Health and Family Welfare (NIHFW) also supports biomedical and operations research and training. The Central Drug Research Institute in Lucknow undertakes chemical, toxicological and clinical research. University research

centers exist in New Delhi (especially the All-India Institute of Medical Sciences), Bombay, Chandigarh, Bangalore and Calcutta, among others.

Demographic research centers are also extensive, and the number of demographers and other population specialists (excluding biomedical scientists) exceeds the 400 membership of the Indian Association for Population Studies. The International Institute for Population Studies in Bombay has been a leader in demographic and program-related research. Indian demographers, by and large, have had statistical or mathematical orientation. A social science perspective on population issues, in general, has been lacking. Only a few centers are engaged in broad-based, policy-oriented, social science research. The important research (including policy research) groups include the Center for Policy Research and the Institute of Economic Growth in New Delhi, the Sardar Patel Institute in Ahmedabad, and the Institute for Social and Economic Change in Bangalore.

Operations and Management Research is undertaken by the Operations Research Group, the Indian Institute of Management, as well as several of the previously mentioned organizations. At the state level, Centers for Population Research undertake both operations and social sciences research.

The Family Planning Foundation of India provides grants for research, organizes seminars, supports publications, and attempts to ensure that relevant research is made available to policymakers.

This brief summary only touches the surface of the range and roles of institutions contributing to population matters in India. While these and many other groups have contributed substantially to service and research, we believe that their roles can be greatly extended. Service groups can expand their service coverage, collaborate with the government in training, and

demonstrate innovative approaches to family planning delivery. While the amount of research in India has been significant, its impact on policy and programs has been insufficient. Expansion of operations research at state level, and policy research at the federal level, would be especially desirable.

## V. FAMILY PLANNING PROGRAM PERFORMANCE

### NATIONAL LEVEL PERFORMANCE

#### Family Planning Acceptors

The performance of the family planning program in terms of numbers of acceptors is well documented by service statistics dating back to 1956. In addition to reporting the numbers of acceptors of sterilization and the IUD, program records on supplies of conventional contraceptives (mainly Nirodh) and oral contraceptives have been translated into "equivalent conventional contraceptive users," which are estimates of the number of couple-years of protection provided by such supplies. Columns 2, 3, and 4 of Table 3 present the numbers of sterilizations, IUD insertions, and equivalent conventional contraceptive users reported each year from 1956 to 1980/81. The figures for 1956 through 1964 refer to calendar years and those from 1966/67 through 1980/81 to fiscal years, April through March. The figures for 1965/66 refer to the 15-month period from January 1965 through March 1966.

Until 1965, during the formative years of the program, only a minute fraction of the total number of married couples with wives in the reproductive age groups 15 to 44 years (MwRA) were registered as acceptors each year. However, during the Third Five-Year Plan (1961-66), the increasing numbers of sterilizations were augmented by intensified promotion of conventional contraceptives and, starting in 1965, a vigorous campaign to promote the IUD. As a result of these joint efforts, family planning acceptance rose dramatically in 1965/66. The magnitude of the rise can best be seen by looking at the trend in "equivalent sterilization" shown in Column 5 of Table 3. This measure is preferable to a simple summation of the figures in Columns 2, 3, and 4, since

TABLE 3: FAMILY PLANNING ACCEPTORS (IN THOUSANDS)  
BY METHOD, 1956 TO 1980/81

| Year<br>(1)          | Sterilizations<br>(2) | IUD<br>Insertions<br>(3) | Equivalent<br>CC User<br>(4) | Sterilizations<br>Number<br>(5) | Equivalent<br>% of MWRA<br>(6) |
|----------------------|-----------------------|--------------------------|------------------------------|---------------------------------|--------------------------------|
| 1956                 | 7                     |                          |                              | 7                               | 0.01                           |
| 1957                 | 14                    |                          |                              | 14                              | 0.02                           |
| 1958                 | 25                    |                          |                              | 25                              | 0.04                           |
| 1959                 | 42                    |                          |                              | 42                              | 0.06                           |
| 1960                 | 64                    |                          |                              | 64                              | 0.09                           |
| 1961                 | 105                   |                          |                              | 105                             | 0.14                           |
| 1962                 | 158                   |                          |                              | 158                             | 0.21                           |
| 1963                 | 170                   |                          | 298                          | 207                             | 0.27                           |
| 1964                 | 270                   |                          | 439                          | 306                             | 0.38                           |
| 1/65-3/66            | 671                   | 813                      | 582                          | 990                             | 1.20                           |
| 1966/67              | 887                   | 910                      | 465                          | 1,229                           | 1.40                           |
| 1967/68              | 1,840                 | 669                      | 475                          | 2,102                           | 2.40                           |
| 1968/69              | 1,665                 | 479                      | 961                          | 1,904                           | 2.10                           |
| 1969/70              | 1,422                 | 459                      | 1,509                        | 1,701                           | 1.90                           |
| 1970/71              | 1,330                 | 476                      | 1,962                        | 1,652                           | 1.80                           |
| 1971/72              | 2,187                 | 488                      | 2,354                        | 2,481                           | 2.60                           |
| 1972/73              | 3,122                 | 355                      | 2,398                        | 3,373                           | 3.50                           |
| 1973/74              | 942                   | 372                      | 3,010                        | 1,233                           | 1.20                           |
| 1974/75              | 1,354                 | 433                      | 2,521                        | 1,638                           | 1.60                           |
| 1975/76              | 2,669                 | 607                      | 3,528                        | 3,068                           | 3.00                           |
| 1976/77              | 8,261                 | 581                      | 3,692                        | 8,663                           | 8.20                           |
| 1977/78              | 949                   | 326                      | 3,253                        | 1,242                           | 1.20                           |
| 1978/79              | 1,484                 | 552                      | 3,469                        | 1,865                           | 1.70                           |
| 1979/80              | 1,773                 | 634                      | 3,036                        | 2,158                           | 1.90                           |
| 1980/81 <sup>a</sup> | 1,990                 | 600                      | 3,790                        | 2,404                           | 2.10                           |
| 1981/82 <sup>b</sup> | 2,428                 | 688                      | 4,082                        | 2,869                           | 2:50                           |

Source: Ministry of Health and Family Welfare. Family Welfare Programme in India: Year Book, 1979-80, New Delhi (1981).

- a. Estimates based on data reported in Visaria and Visaria, "India's Population: Second and Growing," Population Bulletin, 6:4 (1981).
- b. Estimates based on comparison of data for April-December, 1981, with data for April-December, 1980.

the data on conventional contraceptive use are not directly comparable to the data on sterilization and IUD acceptance. The MOH<sup>SW</sup> resolved the problem of non-comparability by converting the data on IUD insertions and conventional contraceptive practice into units that are approximately equivalent to sterilization in terms of long-term effects on fertility. This conversion is made by assuming that three IUD insertions, nine couple-years of pill use, and 18 couple-years of conventional contraceptive use, respectively, are equivalent to one sterilization. It can be seen that the number of equivalent sterilizations rose by more than three times from 1964 to 1965/66, when it exceeded one percent of the M<sup>W</sup>RA for the first time. The rise continued, though less dramatically, to a peak in 1967/68, then began a gradual decline that was not reversed until 1971/72.

During the 1970s, the program passed through two cycles in which performance dramatically rose and fell. The first peak was achieved in 1972/73 through the widespread implementation of mass sterilization (primarily vasectomy) "camps," which were discontinued shortly thereafter as a result of a variety of factors, including adverse publicity, administrative difficulties, reduced caseloads, and reduced funding. The second peak resulted from the intense sterilization drive during the Emergency, which lasted from June 1975 to January 1977. In 1976/77, the number of reported sterilizations (again mostly vasectomies) reached 8,261 (7.8 percent of M<sup>W</sup>RA) -- more than two and a half times the previous peak of 3,122 sterilizations performed during 1972/73. Following the defeat of Prime Minister Gandhi's government in 1977, the number of sterilizations plummeted to 941,000 in 1977/78 but then increased gradually to about 1,990,000 in 1980/81. Data for the first nine months of 1981/82 indicate a continuation and acceleration of the upward trend. The increasing

number of sterilizations was accompanied by increased use of the IUD, oral pills and conventional contraceptives but the increases in sterilization acceptance exceeded the increases in the acceptance and use of other methods. Whereas in 1977/78 sterilization accounted for only 76 percent of the total equivalent sterilizations, they accounted for 83 percent in 1980/81 and 84 percent in 1981/82. The number of sterilization equivalents in 1980/81, 2,404,000, was a little over two percent of the estimated number of MWRAs. Though this percentage was well below the peaks of 8.2 percent in 1976/77 and 3.5 percent in 1972/73, it was higher than the percentages for six of the preceding ten years, indicating substantial revitalization of the program in the wake of the near collapse that followed the Emergency. The more tenuous projections for 1981/82 indicate a further increase to 2.5 percent, a level exceeded to an appreciable extent in only three of the preceding years since the inception of the family planning program.

The numbers of sterilizations reported for 1970/71 to 1980/81 are broken down by type (vasectomy versus tubectomy) in Table 4. It can be seen that the ratio of vasectomies to tubectomies during this entire period was 1.45 but that it fluctuated widely. Up to 1976/77, vasectomies were more common than tubectomies in five of the seven years, and the ratio exceeded 3.0 in the peak years of the sterilization camps and the Emergency drive. Since the end of Emergency, the numbers of vasectomies have been only about one-fourth to one-third the numbers of tubectomies. Whereas the increases in tubectomy acceptance over time have been fairly smooth, the trend in vasectomies has been much more erratic, rising to sharp peaks in 1972/73 and 1976/77 and plunging even more steeply thereafter. This pattern apparently reflects a tendency for vasectomy to be more suitable for mass campaigns, where conditions favor a

TABLE 4: TREND IN NUMBERS OF VASECTOMIES AND TUBECTOMIES,  
1970/71 TO 1980/81 (NUMBERS IN THOUSANDS)

| Year         | Vasectomies<br>(V) | Tubectomies<br>(T) | V/T Ratio   |
|--------------|--------------------|--------------------|-------------|
| 1970/71      | 879                | 451                | 1.95        |
| 1971/72      | 1,620              | 567                | 2.86        |
| 1972/73      | 2,613              | 509                | 5.13        |
| 1973/74      | 403                | 539                | .75         |
| 1974/75      | 612                | 742                | .82         |
| 1975/76      | 1,438              | 1,230              | 1.17        |
| 1976/77      | 6,199              | 2,062              | 3.01        |
| 1977/78      | 188                | 761                | .25         |
| 1978/79      | 391                | 1,093              | .36         |
| 1979/80      | 471                | 1,302              | .36         |
| 1980/81      | 420                | 1,550              | .27         |
| <b>Total</b> | <b>15,234</b>      | <b>10,806</b>      | <b>1.45</b> |

Sources: Ministry of Health and Family Welfare (op. cit.);  
Visaria and Visaria (op. cit.).

relatively safe, quick method. It appears that there may be an underlying preference for tubectomy when both methods are equally strongly promoted and readily available, though reasons for this preference are not clear. The increasing tendency of couples to elect tubectomy creates additional problems for the program, since tubectomy requires more time of highly skilled medical personnel and more allocation of medical facilities than vasectomy.

The data in Table 3 on conventional contraceptive use refer almost entirely to use of condoms. For instance, in 1980/81, 266 million condoms, 1.15 million pill cycles, 1,454 diaphragms, 63,000 tubes of jelly or cream, and 25,000 foam tablets were distributed. These quantities translate into about 3.69 million couple-years of condom use, 88,000 couple-years of pill use, and 9,800 couple-years of use of the three other methods. Thus, condoms accounted for 97.4 percent of the use of conventional contraceptives, pills for 2.3 percent and the other methods for only 0.3 percent.

### Prevalence

Estimates of contraceptive prevalence derived from the data on numbers of acceptors indicate an increase from 0.2 percent in December 1960 to 3.0 percent in March 1966 and 8.7 percent in March 1969, followed by the annual figures given in Column 5 of Table 5 for 1971 to 1981. The trend from 1966 to 1981 is illustrated in Figure 1. The picture is one of steady increase through 1972/73, followed by a lull of two years and sharp increase in 1975/76 and 1976/77 to a peak of 25.7 percent in March 1977. Following that peak, the estimated prevalence level declined to 24.4 percent in March 1978 and remained approximately constant until 1980/81, when it began to rise again. The effective prevalence figures (adjusted to compensate for the probability of contra-

TABLE 5: ESTIMATES OF PREVALENCE OF USE  
OF PROGRAM METHODS, 1970/71 TO 1980/81

| Year<br>(31 March)<br>(1) | Percentage Protected      |            |                        |                           | Percentage Effectively Protected |            |                        |                           |
|---------------------------|---------------------------|------------|------------------------|---------------------------|----------------------------------|------------|------------------------|---------------------------|
|                           | Steri-<br>lization<br>(2) | IUD<br>(3) | CC <sup>a</sup><br>(4) | Total <sup>b</sup><br>(5) | Steri-<br>lization<br>(6)        | IUD<br>(7) | CC <sup>a</sup><br>(8) | Total <sup>b</sup><br>(9) |
| 1971                      | 8.1                       | 1.5        | 2.1                    | 11.7                      | 8.1                              | 1.4        | 1.1                    | 10.6                      |
| 1972                      | 9.9                       | 1.4        | 2.5                    | 13.7                      | 9.9                              | 1.3        | 1.2                    | 12.4                      |
| 1973                      | 12.3                      | 1.2        | 2.5                    | 16.0                      | 12.3                             | 1.1        | 1.2                    | 14.7                      |
| 1974                      | 12.4                      | 1.1        | 3.0                    | 16.5                      | 12.4                             | 1.0        | 1.5                    | 14.9                      |
| 1975                      | 12.9                      | 1.0        | 2.5                    | 16.4                      | 12.9                             | 1.0        | 1.2                    | 15.1                      |
| 1976                      | 14.5                      | 1.1        | 3.4                    | 19.0                      | 14.5                             | 1.0        | 1.7                    | 17.2                      |
| 1977                      | 21.1                      | 1.1        | 3.5                    | 25.7                      | 21.1                             | 1.1        | 1.8                    | 23.9                      |
| 1978                      | 20.4                      | .9         | 3.0                    | 24.4                      | 20.4                             | .9         | 1.5                    | 22.8                      |
| 1979                      | 20.2                      | 1.0        | 3.2                    | 24.3                      | 20.2                             | .9         | 1.6                    | 22.7                      |
| 1980                      | 20.2                      | 1.0        | 2.7                    | 24.0                      | 20.2                             | 1.0        | 1.4                    | 22.6                      |
| 1981                      | -                         | -          | -                      | -                         | -                                | -          | -                      | 23.1 <sup>c</sup>         |

Sources: Ministry of Health and Family Welfare (op. cit.); Visaria and Visaria (op. cit.).

a. Conventional contraceptives.

b. These percentages are based on estimates of MWRA made before the 1981 census results became available rather than the higher revised estimates, since, as Visaria and Visaria note, the error in the projected total population is attributable to underestimation of the number of births rather than the number of MWRA.

c. Provisional estimates.

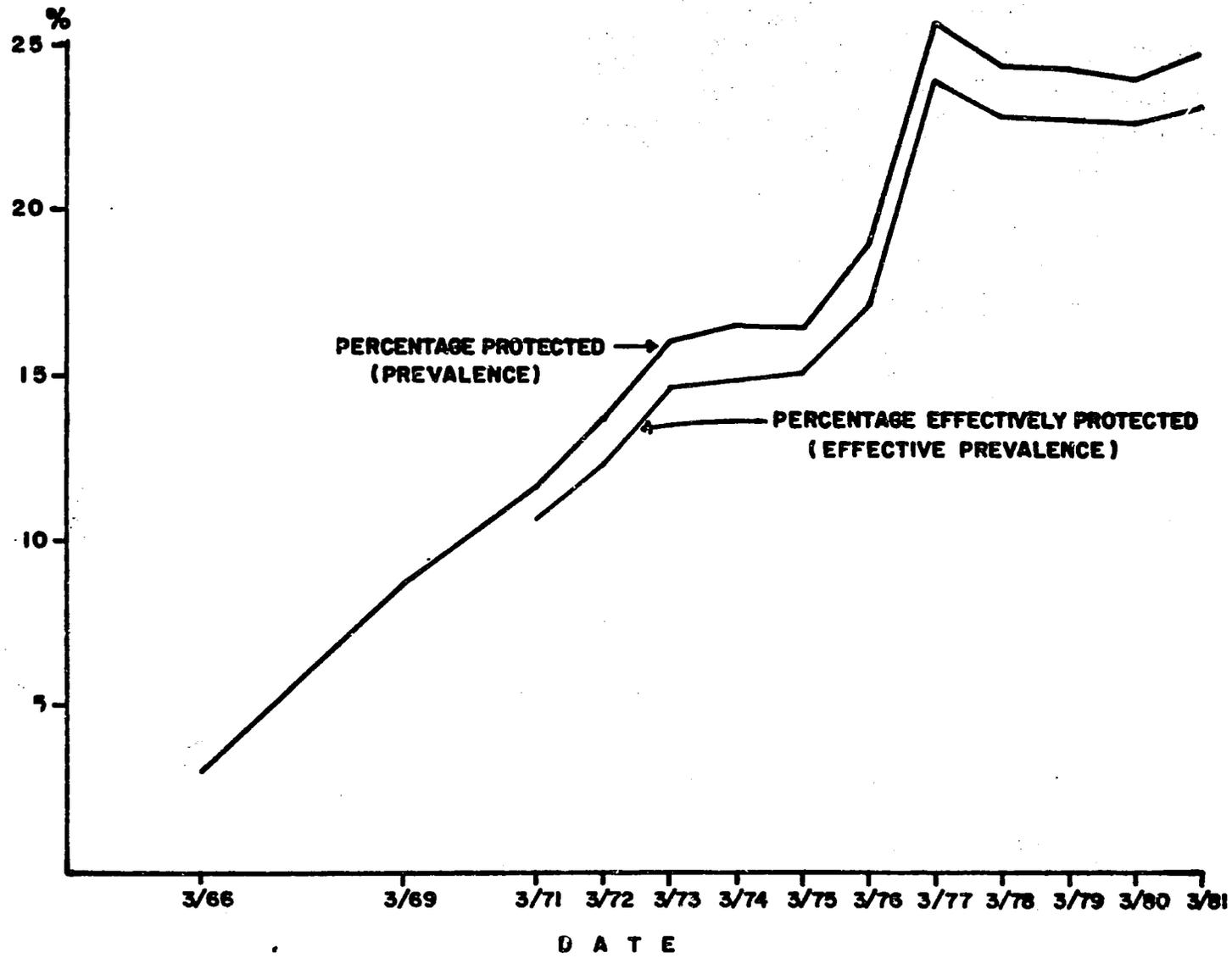


FIGURE 1. TREND IN PREVALENCE AND EFFECTIVE PREVALENCE

ceptive failure among users of the IUD and conventional contraceptives) have followed a similar pattern, as can be seen in Column 9 of Table 5 and in Figure 1. The numbers of annual acceptors following the Emergency drive have been just enough to compensate for natural attrition (discontinuation of reversible methods and the passage of sterilized couples out of the childbearing ages). The percentage effectively protected appears to have risen slightly in 1980/81. The preliminary estimates of numbers of acceptors in 1982 suggest that the percentage effectively protected by March 1982 might increase to the previous peak level reached in March 1977.

It can be seen from both Tables 3 and 5 that the program since its inception has relied primarily on sterilization. The figures from Columns 6 and 9 of Table 5 indicate that sterilization accounted for 76 percent of the "effective prevalence" in March 1971; the contribution of sterilization rose thereafter, reaching 89 percent in March 1980. Since sterilization is appropriate for couples who definitely want no more children, it appears that the program has had very little success in reaching those who are uncertain or want to space their children. There may exist a large potential demand for reversible methods among such couples.

Between 1966 and 1973, the prevalence of contraceptive practice increased almost linearly, adding nearly two percentage points each year. In relation to the early trend, prevalence since 1973 appears to have fallen far short of the levels that might have been expected on the basis of this early trend, with the sole exception of the peak achieved during the intensive drive of the Emergency. Viewed from this perspective, the post-Emergency decline and stagnation appear to constitute a severe setback. However, this setback may be only temporary. Following the fall of the Gandhi government in 1977,

the pressures and incentives for encouraging contraceptive practice were greatly relaxed and even following Mrs. Gandhi's reelection in January 1980, the government continued to take a low-key approach to family planning. However, following publication of the first provisional 1981 Census report, which indicated that the intercensal growth for 1971-81 was no lower than that for 1961-71, concern about the need to reduce population growth increased sharply. If the government should intensify its efforts once again, such renewed efforts are likely to increase contraceptive prevalence. This likelihood is underscored by the fact that the effective prevalence rate rose somewhat in 1980/81 even without much intensification of government support.

The program statistics on contraceptive practice are limited to methods obtained from the program; they do not include effective practice of methods obtained from outside the program. On the other hand, program statistics are likely to overestimate use due to overreporting, especially (under the pressure of) special drives.

Data relevant to these last two points are available from three surveys conducted in the early 1970s. A nationwide survey conducted in 1970 by the Operations Research Group found a national prevalence rate of 13.6 percent, but only 9.7 percent of the couples reported use of program methods. The proportion of couples reporting use of sterilization was 25 percent lower than the proportion indicated by program statistics, and the proportion reporting use of the IUD was 59 percent lower. However, the difference in use of program methods was more than compensated for by figures on use of non-program methods, such as withdrawal and abstinence, reported in the survey.

A survey conducted in 1971-72 by the Office of the Registrar General indicated a higher prevalence of program methods (15 percent) and a lower pre-

valence of others (about one percent). However, the survey data indicated much more use of condoms than program statistics indicated for March 1972 (9.1 percent versus 2.5 percent), and less use of sterilization (5.2 percent versus 9.9 percent).

In 1973-74, the National Sample Survey (NSS) found a prevalence rate of only 13.0 percent, including 2.2 percent for non-program methods. In contrast, the program estimate of prevalence in March 1974 was 16.4, excluding non-program methods. However, the fact that the NSS found lower prevalence than either of the preceding surveys suggests a serious downward bias in the NSS estimate. Furthermore, the inconsistencies among all three surveys with regard to method mix call into question the reliability of all the survey estimates of prevalence. It is likely that all three surveys tended to underestimate prevalence, as is common in places where respondents are not accustomed to discussing contraception and may be embarrassed to admit to contraceptive practice.

On balance, the comparison of program estimates and survey data on prevalence during the early 1970s seems to suggest that any upward bias in estimated prevalence caused by overreporting was approximately canceled by the omission of non-program contraception. It is not known whether the situation remained unchanged during the late 1970s, especially considering the eight million sterilizations that were reported during the Emergency drive.

#### Performance in Relation to Targets

Program performance has rarely achieved or even approached targets set by the national government. Table 6 shows the targeted numbers of sterilizations, IUD insertions, and conventional contraceptive users for the eleven

TABLE 6: PROGRAM TARGETS AND PERCENTAGES OF TARGETS  
(IN MILLIONS) ACHIEVED, 1970/71 TO 1980/81

| Year    | Sterilization |        | IUD Insertions |        | CC Users |        |
|---------|---------------|--------|----------------|--------|----------|--------|
|         | Target        | % Ach. | Target         | % Ach. | Target   | % Ach. |
| 1970/71 | 2.60          | 51     | .90            | 53     | 4.80     | 41     |
| 1971/72 | 2.08          | 105    | .83            | 59     | 3.83     | 61     |
| 1972/73 | 5.70          | 55     | .95            | 37     | 4.26     | 56     |
| 1973/74 | 2.27          | 41     | .67            | 55     | 4.30     | 70     |
| 1974/75 | 2.00          | 68     | .60            | 72     | 3.50     | 72     |
| 1975/76 | 2.49          | 107    | .91            | 67     | 4.26     | 83     |
| 1976/77 | 4.30          | 192    | 1.41           | 51     | 4.69     | 79     |
| 1977/78 | -             | -      | 1.00           | 33     | 5.00     | 65     |
| 1978/79 | 3.97          | 37     | .60            | 92     | 4.00     | 87     |
| 1979/80 | 3.05          | 58     | 1.15           | 55     | 5.50     | 55     |
| 1980/81 | 2.90          | 69     | .79            | 76     | 5.54     | 68     |

Sources: Ministry of Health and Family Welfare (op. cit.); Visaria and Visaria (op. cit.).

years from 1970/71 to 1980/81. Sterilization targets were not set for 1977/78, the first year after the Emergency, and were met or exceeded in only three of the remaining ten years. Targets for IUD insertions and conventional contraceptive use have not been achieved in any of the eleven years. The percentages of IUD targets achieved an average of about 60, ranging from 33 to 92; the percentages for use of conventional contraceptives averaged about 67, ranging from 41 to 87.

The pattern of underachievement of targets appears to apply as much to the individual states as to India as a whole. In 1980/81, for instance, none of the states achieved 100 percent of their targets for sterilization operations or for use of oral contraceptives. Only Punjab achieved 100 percent of its target for use of conventional contraceptives, and only Punjab, Jammu and Kashmir, and Haryana exceeded their IUD targets. Large proportions of the states failed to achieve even half of their targets for specific methods: 40 percent in the case of IUD targets, half in the case of sterilization, two-thirds in the case of conventional contraceptives, and all but one (Gujarat) in the case of oral contraceptives. Thus, acceptor targets appear to have been excessively optimistic in relation to program resources and implementation.

#### ACCESSIBILITY OF SERVICES

In 1979, there were 5,358 rural family welfare centers to serve 89.1 million rural eligible couples and 1,957 urban centers to serve 20.6 million urban couples. On the average, then, there was one center for every 16,600 rural couples and one center for every 10,500 urban couples. The rural centers were augmented by some 46,564 subcenters -- an average of one sub-

center for every 1,900 rural couples. However, the auxiliary nurse-midwives who staff the subcenters are not able to perform sterilizations or even prescribe pills for more than three months without the assistance of a physician, and many are not authorized to insert IUDs. Thus, the most effective methods tend not to be available at the subcenter level. Some of the family welfare centers are not staffed by doctors, in which case, even at this level, such methods cannot be offered on a regular basis. Of the 5,356 "required" medical officers in rural areas, 4,648 (87 percent) were in place in 1979, covering an average of 19,000 couples each. In urban areas, of 1,197 positions for medical officers, only 855 (71 percent) were filled, one for every 24,000 couples.

Sterilization has been available only at the district level or above. To make sterilization more readily available to rural couples, construction of additional sterilization facilities has been authorized for 325 subdistrict hospitals and 1,000 primary health centers. By 30 September 1980, 266 of the former and 754 of the latter had been completed.

In urban areas, the efforts of family welfare centers are augmented by three special programs: the Postpartum Program, the Nirodh Program, and the Medical Termination of Pregnancy (MTP) Program. Under the Postpartum Program, 524 postpartum centers have been established -- primarily in district hospitals and teaching hospitals -- where family planning services are offered to obstetric (OB) and abortion (AB) cases. There is one postpartum center for every 40,000 urban couples. In 1979/80, reports from 385 of the centers indicated that they served 847,000 OB cases and 277,000 AB cases (101,000 spontaneous abortions and 176,000 MTP cases); the total number of OB and AB cases per reporting center was 2,919. These centers reported a total of

418,000 acceptors, of which 267,000 were "direct" (cases who accepted within three months postpartum or postabortum). Thus, 23.4 percent of the deliveries or abortions in these centers were followed within three months by acceptance of family planning. The Sixth Five Year Plan calls for the establishment of 300 postpartum centers in subdistrict hospitals. This will bring postpartum services closer to rural women, but it is doubtful that it can have much effect on rural contraceptive practice or fertility, since most deliveries in the rural areas occur in the home rather than in hospitals.

The second special program that increases the access of urban couples to contraceptives is the Nirodh Marketing Program. This program subsidizes the sale of condoms through an estimated 380,000 retail outlets, which tend to be concentrated in urban areas. These outlets sold 129.5 million condoms in 1980/81. According to MOHFW, this would provide 1.8 million couple-years of protection and would avert an estimated one million births.

The third special program is the MTP program. Since MTP may be performed only by a physician and in a government hospital or a specially licensed private medical facility, it has little impact outside urban areas. The total number of MTP centers as of August 1980 was 3,056, which works out to one for every 7,000 urban couples or one for every 37,000 couples nationwide.

Information about family planning services and where they may be obtained is, of course, more accessible than actual medical services. The Sixth Five-Year Plan calls for training Village Health Guides (VHG's) to provide simple medical information and primary health care, including non-medical family planning services, at the village level. With 140,000 such volunteers reportedly in position as of April 1980, it was initially expected that

360,000 would have been trained by 1985. The plan has recently been revised, calling for training of enough VHGs to have one in each of the country's 575,000 villages by 1985. The effect of the VHGs on the family planning knowledge, attitudes, and practices of the villagers cannot be ascertained without special research studies. Similarly, the coverage of other types of field workers (auxiliary nurse-midwives, multi-purpose health workers, and other paramedical workers) cannot be quantified, since no recent research data are available. A study conducted in selected rural areas of Uttar Pradesh in 1972 found that only 13 percent of the interviewed husbands and eight percent of the wives said they had been visited by a government worker who discussed family planning; 42 percent of the husbands and 24 percent of the wives were aware that such workers had visited the village but said they had not themselves been visited. However, the situation in rural Uttar Pradesh cannot be generalized to the rest of rural India, and the situation may have changed considerably since 1972.

Although effective outreach work requires extensive travel, there are insufficient travel allocations for field supervision and a shortage of vehicles at the state, district, and especially, PHC levels. This problem may be more important than the concentration of medical facilities in urbanized areas, since acceptors receive compensation to help defray the cost of travel to the family welfare centers, but they need to be informed of the services before they can be expected to do so.

## STATE DIFFERENTIALS IN PERFORMANCE

Although the Indian Family Welfare Program is centrally planned and directed, the performance of the program in the various states is by no means uniform. Table 7 shows the prevalence and effective prevalence figures as of 31 March 1980 for the 17 largest states and the Union Territory of Delhi. The unadjusted prevalence rates range from 10.7 (for Jammu and Kashmir) to 35.9 for Maharashtra and 44.1 for Delhi. Effective prevalence rates were somewhat lower, ranging from 10.3 to 35.2 for the states and 36.1 for Delhi. The method mix was less variable, but some states (Delhi, Uttar Pradesh, Punjab, Haryana, Rajasthan, and to a lesser extent, Jammu and Kashmir, Gujarat, Karnataka, and Himachal Pradesh) relied much less heavily than the others on sterilization.

The highest-performing states, in terms of effective prevalence, are Delhi, Maharashtra, Gujarat, Haryana, Kerala, and Tamil Nadu, in that order. The lowest-performing states, with 10-12 percent prevalence, are Jammu and Kashmir, Uttar Pradesh, Bihar, and Rajasthan. Since they include the two largest states (U.P. and Bihar), these four states account for about one-third of all the eligible couples in India. The concentration of such a large proportion of the population in such low-performing states acts as a major obstacle to achieving high prevalence in the country as a whole.

### Relationship of Performance to the Density of Program Inputs

The density of program inputs varies considerably by state. Table 8 shows, for each state and for India as a whole, the density of service facilities and staff in 1979 in relation to estimated average number of MWRA covered. The density of family welfare centers shows little relationship to

TABLE 7: ESTIMATED STATEWISE PREVALENCE AND EFFECTIVE PREVALENCE LEVELS  
AND METHOD MIX, MARCH 1980

(For States/Union Territories with at least 500,000 Eligible Couples)

| State/Union Territory | Eligible Couples <sup>a</sup><br>(1000) | Unadjusted Prevalence (%) | Effective Prevalence (%) | Percent of Users relying on: |      |       |
|-----------------------|---|---------------------------|--------------------------|------------------------------|------|-------|
|                       |   |                           |                          | Sterilization                | IUD  | Other |
| Andhra Pradesh        | 9,115                                   | 26.9                      | 26.7                     | 97.2                         | 1.3  | 1.5   |
| Assam                 | 2,849                                   | 19.6                      | 19.3                     | 94.3                         | 2.8  | 2.9   |
| Bihar                 | 12,544                                  | 12.6                      | 12.3                     | 93.2                         | 2.7  | 4.1   |
| Gujarat               | 5,317                                   | 34.5                      | 32.8                     | 86.0                         | 3.8  | 10.2  |
| Haryana               | 1,969                                   | 33.4                      | 30.3                     | 71.3                         | 11.3 | 17.4  |
| Himachal Pradesh      | 718                                     | 24.5                      | 23.8                     | 88.6                         | 6.3  | 5.1   |
| Jammu & Kashmir       | 987                                     | 10.7                      | 10.3                     | 83.0                         | 8.5  | 8.5   |
| Karnataka             | 5,738                                   | 23.7                      | 22.9                     | 87.9                         | 5.7  | 6.5   |
| Kerala                | 3,575                                   | 29.7                      | 29.4                     | 94.9                         | 3.3  | 1.7   |
| Madhya Pradesh        | 9,254                                   | 21.6                      | 21.1                     | 93.7                         | 2.4  | 3.9   |
| Maharashtra           | 10,234                                  | 35.9                      | 35.2                     | 94.8                         | 1.3  | 3.9   |
| Orissa                | 4,650                                   | 25.3                      | 24.8                     | 93.1                         | 3.2  | 3.7   |
| Punjab                | 2,269                                   | 27.6                      | 25.0                     | 70.2                         | 12.0 | 17.7  |
| Rajasthan             | 5,850                                   | 14.3                      | 13.3                     | 80.8                         | 4.8  | 14.5  |
| Tamil Nadu            | 7,901                                   | 29.1                      | 28.6                     | 93.9                         | 2.9  | 3.2   |
| Uttar Pradesh         | 18,404                                  | 12.6                      | 11.6                     | 70.2                         | 16.2 | 13.5  |
| West Bengal           | 8,334                                   | 22.6                      | 22.0                     | 92.4                         | 1.9  | 5.7   |
| Delhi                 | 934                                     | 44.1                      | 36.1                     | 53.2                         | 11.2 | 35.7  |

Source: Ministry of Health and Family Welfare (op. cit.).

a. Projection based on 1971 census data.

TABLE 8: DENSITY OF FAMILY WELFARE FACILITIES AND STAFF, 1979,  
BY STATE, ARRANGED BY 1980 PERFORMANCE LEVEL

| Performance Level<br>(1980 Effective<br>Prevalence) | State/U.T.        | Total FW Centers<br>Per Million<br>Couples (Urban<br>plus Rural) | Number of<br>Subcenters<br>Per Million<br>Rural Couples | Rural Staff<br>Per Million<br>Rural Couples |
|---|-------------------|--|---|---|
| Highest: 36.1                                       | Delhi             | 62   | 543   | 543 (L)                                     |
| 35.2  | Maharashtra       | 61   | 487   | 644   |
| 32.8  | Gujarat           | 79   | 510   | 918 (H)                                     |
| 30.3  | Haryana           | 65   | 645 (H)   | 768   |
| 29.7  | Kerala            | 53 (L)   | 732 (H)   | 1,088 (H)                                   |
| 29.1  | Tamil Nadu        | 78   | 527   | 863 (H)                                     |
| Middle: 26.9  | Andhra Pradesh    | 63   | 549   | 796   |
| 25.0  | Punjab            | 72   | 959 (H)   | 937 (H)                                     |
| 24.8  | Orissa            | 78   | 489   | 714   |
| 23.8  | Himachal Pradesh  | 125 (H)  | 489   | 612   |
| 22.9  | Karnataka         | 71   | 801 (H)   | 612   |
| 22.0  | West Bengal       | 61   | 448 (L)   | 545 (L)                                     |
| Lowest: 21.1  | Madhya Pradesh    | 60   | 637 (H)   | 804 (H)                                     |
| 19.3  | Assam             | 66   | 287 (L)   | 295 (L)                                     |
| 13.3  | Rajasthan         | 66   | 449 (L)   | 475 (L)                                     |
| 12.3  | Bihar             | 54 (L)   | 432 (L)   | 506 (L)                                     |
| 11.6  | Uttar Pradesh     | 61   | 481 (L)   | 704   |
| 10.3  | Jammu and Kashmir | 107 (H)  | 528   | 531 (L)                                     |
| India   |                   | 67   | 523   | 683   |

Source: Ministry of Health and Family Welfare (op. cit.).

H = High

L = Low

performance, but the density of rural subcenters and rural staff in relation to the estimated numbers of rural MWRA is clearly related to prevalence levels. Among the high-performance states, only New Delhi and Maharashtra are not also high on at least one of the measures of density of rural inputs; and among the low-performance states, only Madhya Pradesh has high density of rural facilities and staff. Among the middle-performance states, Punjab and Karnataka appear to have disproportionately high density of rural inputs.

#### Relationship of Performance to Socioeconomic Conditions

The variations in performance appear to have been attributable largely to differences in socioeconomic conditions (Table 9). The states with the highest effective prevalence levels in 1980 tended to be the ones with the highest per capita net state domestic products, highest literacy rates, and highest percentages of their populations living in urban places. Reading of Table 9 is facilitated by reference to the letters (H and L) following the figures shown for each indicator, denoting the states that are particularly high or low, respectively, with regard to that indicator. It can be seen that none of the highest-performing states ranks unusually low by any socioeconomic indicator and that none of the lowest performing states ranks especially high.

#### Relationship of Performance to Demographic Indicators

The family planning performance of the states tends to be related to some demographic measures as well (Table 10). The infant mortality rate tends to be lower in the highest-performing states and higher in the lowest-performing states. However, there are two notable exceptions: Gujarat, one

TABLE 9: SELECTED INDICATORS OF SOCIOECONOMIC CONDITIONS,  
BY STATE, ARRANGED BY 1980 PERFORMANCE LEVEL

| Performance Level<br>(1980 Effective<br>Prevalence) | State/U.T. | Per Capita Net<br>State Domestic<br>Product (1977-78) | Literacy Rate <sup>a</sup><br>(1981) for: |         | Percent<br>Urban<br>(1971) |        |
|---|------------|---|---|---------|----------------------------|--------|
|   |            |   | Males                                     | Females |                            |        |
| Highest:  | 36.1       | Delhi   | Rs. 2,358 (H)                             | 68% (H) | 53% (H)                    | 90 (H) |
|   | 35.2       | Maharashtra   | 1,642 (H)                                 | 59 (H)  | 35 (H)                     | 31 (H) |
|   | 32.8       | Gujarat   | 1,455 (H)                                 | 55 (H)  | 32                         | 28 (H) |
|   | 30.3       | Haryana   | 1,649 (H)                                 | 48      | 22                         | 18     |
|   | 29.7       | Kerala  | 985                                       | 74 (H)  | 64 (H)                     | 16     |
|   | 29.1       | Tamil Nadu  | 1,038                                     | 57 (H)  | 34 (H)                     | 30 (H) |
| Middle:   | 26.9       | Andhra Pradesh  | 1,035                                     | 39 (L)  | 21                         | 19     |
|   | 25.0       | Punjab  | 1,998 (H)                                 | 47      | 34 (H)                     | 24     |
|   | 24.8       | Orissa  | 803 (L)                                   | 47      | 21                         | 8 (L)  |
|   | 23.8       | Himachal Pradesh                                      | 1,180                                     | 52      | 31                         | 7 (L)  |
|   | 22.9       | Karnataka   | 1,130                                     | 49      | 28                         | 24     |
|   | 22.0       | West Bengal   | 1,243                                     | 50      | 30                         | 25     |
| Lowest:   | 21.1       | Madhya Pradesh  | 907 (L)                                   | 39 (L)  | 16 (L)                     | 16     |
|   | 19.3       | Assam   | 900 (L)                                   | *       | *                          | 9 (L)  |
|   | 13.3       | Rajasthan   | 959 (L)                                   | 36 (L)  | 11 (L)                     | 18     |
|   | 12.3       | Bihar   | 733 (L)                                   | 38 (L)  | 14 (L)                     | 10 (L) |
|   | 11.6       | Uttar Pradesh   | 917 (L)                                   | 39 (L)  | 14 (L)                     | 14 (L) |
|   | 10.3       | Jammu and Kashmir                                     | 981                                       | *       | *                          | 19     |

Source: Ministry of Health and Family Welfare (op. cit.); Padmanabha, P.,  
Census of India, 1981: Provisional Population Totals, Series T,  
Paper I, Paper I of 1981, New Delhi: Office of the Registrar General  
(1981).

\* Not Available.

a. Provisional census data. Denominator consists of all persons of the specified sex irrespective of age.

H = High

L = Low

of the highest-performing states, is characterized by an unusually high infant mortality rate; and Jammu and Kashmir, the lowest-performing state of those shown in Table 10, has an unusually low infant mortality rate.

The proportion of the total population comprised of married women in the reproductive ages (MWRA) is included in Table 10 as an indicator of age at marriage in the absence of precise measures of that variable. Performance tends to be lowest in those places where MWRA constitute a relatively large proportion of the total population (indicating relatively early marriages). This is probably because MWRA are younger on the average in such places and younger women are less likely to adopt sterilization.

The other three demographic indicators in Table 10 are included because they indicate the extent to which contraceptive practice appears to have influenced fertility and population growth. The program's effect on population growth would, of course, be mediated through its effect on fertility. However, the data on fertility from the sample registration system (SRS) are known to be deficient, and the degree of deficiency probably varies from state to state. As a result, the figures shown in Table 10 for the CBR are not as highly correlated with effective prevalence rates as might be expected. However, there is a distinct relationship, and only one major anomaly: the crude birth rate for Gujarat is one of the highest although Gujarat has one of the highest effective prevalence rates. Similarly, there is only one major anomaly in the relationship between effective prevalence and the 1971-81 growth rate: Delhi experienced by far the highest growth rate in the 1970s in spite of the fact that it had the highest prevalence rate. This is clearly a reflection of the high rate of in-migration to Delhi rather than of error in measurement of either its effective prevalence level or its growth rate.

TABLE 10: SELECTED DEMOGRAPHIC INDICATORS, BY STATE, ARRANGED BY 1980 PERFORMANCE LEVEL

| Performance Level (1980 Effective Prevalence) | State/U.T.            | Infant Mortality Rate (Average, 1974-76) | MWRA as % of Total Population (1971) | Estimated CBR (SRS, 1978) | Intercensal Growth Rate (1971-81) | Percentage Change in Intercensal Growth Rate (1961-71 to 1971-81) |
|---|-----------------------|--|--------------------------------------|---------------------------|-----------------------------------|---|
| Highest:                                      | 36.1 Delhi            | 58 (L)                                   | 15.7 (L)                             | 25.7 (L)                  | 52.4 (H)                          | - 1   |
|   | 35.2 Maharashtra      | 88 (L)                                   | 17.1                                 | 26.9 (L)                  | 24.4                              | - 11  |
|   | 32.8 Gujarat          | 136 (H)                                  | 16.4                                 | 35.8 (H)                  | 27.2                              | - 7   |
|   | 30.3 Haryana          | 109                                      | 16.1                                 | 33.5                      | 28.0                              | - 13 (L)  |
|   | 29.7 Kerala           | 55 (L)                                   | 14.0 (L)                             | 25.2 (L)                  | 19.0 (L)                          | - 28 (L)  |
|   | 29.1 Tamil Nadu       | 109                                      | 16.9                                 | 28.8                      | 17.2 (L)                          | - 23 (L)  |
| Middle:                                       | 26.9 Andhra Pradesh   | 119                                      | 18.0 (H)                             | 33.6                      | 22.8                              | + 9   |
|   | 25.0 Punjab           | 101                                      | 14.3 (L)                             | 29.4                      | 23.0                              | + 6   |
|   | 24.8 Orissa           | 142 (H)                                  | 17.5                                 | 32.9                      | 19.7 (L)                          | - 21 (L)  |
|   | 23.8 Himachal Pradesh | 114                                      | 17.3                                 | 27.3 (L)                  | 22.5                              | - 3   |
|   | 22.9 Karnataka        | 85 (L)                                   | 16.4                                 | 29.2                      | 26.4                              | + 9   |
|   | 22.0 West Bengal      | *  | 15.2 (L)                             | 28.4                      | 23.0                              | - 15 (L)  |
| Lowest:                                       | 21.1 Madhya Pradesh   | 142 (H)                                  | 17.8 (H)                             | 37.2 (H)                  | 25.2                              | - 12 (L)  |
|   | 19.3 Assam            | 135 (H)                                  | 15.0 (L)                             | 30.8                      | 36.1 (H)                          | *   |
|   | 13.3 Rajasthan        | 143 (H)                                  | 17.9 (H)                             | 35.5 (H)                  | 32.4 (H)                          | + 16 (H)  |
|   | 12.3 Bihar            | *  | 18.8 (H)                             | *                         | 23.9                              | + 12 (H)  |
|   | 11.6 Uttar Pradesh    | 183 (H)                                  | 17.7 (H)                             | 40.4 (H)                  | 25.5                              | + 29 (H)  |
|   | 10.3 Jammu & Kashmir  | 71 (L)                                   | 16.9                                 | 31.8                      | 29.6 (H)                          | *   |

Sources: Ministry of Health and Family Welfare (op. cit.); Padmanabha (op. cit.).

\* Not Available.

H = High

L = Low

There are no major anomalies between effective prevalence rates and changes in the intercensal growth rates from the 1960s to the 1970s, although rankings of the states by the two measures are rather different.

### Regression Analysis

Of the socioeconomic and demographic indicators just discussed, all of the former and the first two of the latter may be viewed as hypothesized determinants of effective prevalence, whereas the crude birth rate and the two growth rate estimates may be viewed as consequences. Table 11 shows the results of linear regression analysis of prevalence rates in relation to the hypothesized determinants. The strongest correlate of state performance in 1980 was the male literacy rate ( $r = .76$ ), followed closely by the female literacy rate ( $r = .70$ ). The two demographic indicators showed the lowest degree of correlation ( $r = .45$  and  $.39$ , respectively). These correlation coefficients indicate associations and cannot be interpreted literally to imply causation. However, they do suggest that contraceptive use is likely to increase with improvements in education and literacy, with reduction in infant mortality, and with increase in age at marriage.

The relationships between program inputs and contraceptive prevalence are quantified in Table 12 in the form of linear regression and correlation coefficients. The density of rural staff is by far the best predictor of performance, with a correlation coefficient of  $.59$ . Comparison of Tables 11 and 12 reveals that the educational level of the population is more strongly related to effective prevalence than even rural staff density. Since program infrastructure is correlated with socioeconomic level, it appears that the net effect of program inputs on prevalence (controlling for socioeconomic level)

**TABLE 11: RESULTS OF LINEAR REGRESSION OF EFFECTIVE PREVALENCE  
ON SELECTED SOCIOECONOMIC AND DEMOGRAPHIC INDICATORS  
(STATES IN UNITS OF ANALYSIS)**

| <b>Independent Variable</b> | <b>Number of<br/>Observations</b> | <b>Intercept</b> | <b>Regression<br/>Coefficient</b> | <b>r</b> | <b>r<sup>2</sup></b> |
|-----------------------------|-----------------------------------|------------------|-----------------------------------|----------|----------------------|
| Per capita domestic product | 18                                | 13.42            | .01                               | .55      | .31                  |
| Literacy rate for:          |                                   |                  |                                   |          |                      |
| a. Males                    | 16                                | - 1.62           | .53                               | .76      | .58                  |
| b. Females                  | 16                                | 14.01            | .38                               | .70      | .49                  |
| Percent Urban               | 18                                | 18.43            | .23                               | .54      | .29                  |
| Infant mortality rate       | 16                                | 35.87            | - .10                             | - .45    | .20                  |
| MWRA/Population ratio       | 18                                | 62.50            | -2.34                             | - .39    | .15                  |

TABLE 12: RESULTS OF LINEAR REGRESSION OF EFFECTIVE PREVALENCE ON INPUT DENSITY MEASURES (STATES AS UNITS OF ANALYSIS)

| Independent Variable          | Number of Observations | Intercept | Regression Coefficient | r    | r <sup>2</sup> |
|-------------------------------|------------------------|-----------|------------------------|------|----------------|
| Family Welfare Center Density | 18                     | 27.8      | - .057                 | -.13 | .017           |
| Rural Subcenter Density       | 17 <sup>a</sup>        | 15.4      | .014                   | .28  | .081           |
| Rural Staff Density           | 17 <sup>a</sup>        | 7.3       | .023                   | .59  | .35            |

a. Delhi is omitted since it is primarily urban.

is at best weak. This is understandable in view of the low availability and utilization of reversible methods, since the role of rural subcenters and associated staff is limited primarily to recruitment for sterilization.

The relationships between effective prevalence on the one hand and the fertility and population growth indicators on the other are summarized in Table 13. The relationship to the change in the growth rate is greater than the relationship to the 1978 crude birth rate, even though effective prevalence is logically more directly related to fertility. This anomaly is probably in part a result of poor measurement of the crude birth rate and partly a result of state differences in potential fertility of couples in the absence of contraception. The 1971-81 population growth rate is least closely related to 1980 effective prevalence, even when the grossly anomalous case of Delhi is omitted from the analysis. This is probably primarily a result of failure to take account of variations in mortality or in fertility potential in the absence of contraception.

#### COST EFFECTIVENESS

The cost effectiveness of the program for the past few years cannot be accurately ascertained owing to the absence of data on expenditures as opposed to allocations. During the period from 1970/71 to 1978/79 (Table 14), total expenditures rose from Rs. 489 million to Rs. 1,051 million. In constant 1970/71 rupees, however, the rise was only from 489 million to 591 million, and, taking into account the growth of population, the cost per MWRA in constant rupees rose only from 5.32 to 5.42 -- virtually no change at all. However, there were major fluctuations, with sharp increases coinciding with the intensification of sterilization camps in the early 1970s and the Emergency

TABLE 13: RESULTS OF LINEAR REGRESSION OF THE CRUDE BIRTH RATE  
AND THE POPULATION GROWTH RATE ON EFFECTIVE PREVALENCE  
(STATES AS UNITS OF ANALYSIS)

| Dependent Variable    | Number of Observations | Intercept | Regression Coefficient | r     | r <sup>2</sup> |
|-----------------------|------------------------|-----------|------------------------|-------|----------------|
| Estimated CBR         | 17                     | 38.41     | - .29                  | - .52 | .27            |
| 1971-81 growth rate:  |                        |           |                        |       |                |
| a. Including Delhi    | 18                     | 24.39     | .09                    | .09   | .01            |
| b. Excluding Delhi    | 17                     | 31.02     | - .26                  | - .42 | .17            |
| Change in growth rate | 16                     | 28.58     | -1.29                  | - .62 | .38            |

TABLE 14: TRENDS IN COST PER EQUIVALENT STERILIZATION,  
1970/71 TO 1978/79

| Year    | Expenditures (Million Rs.) |                       | Cost per MWRA |                   | Cost per Equiv. Sterilization |                   |
|---------|----------------------------|-----------------------|---------------|-------------------|-------------------------------|-------------------|
|         | Unadjusted                 | Adjusted <sup>a</sup> | Unadj.        | Adj. <sup>a</sup> | Unadj.                        | Adj. <sup>a</sup> |
| 1970/71 | 489                        | 489                   | 5.32          | 5.32              | 306                           | 306               |
| 1971/72 | 618                        | 598                   | 6.57          | 6.36              | 249                           | 241               |
| 1972/73 | 797                        | 717                   | 8.31          | 7.46              | 236                           | 212               |
| 1973/74 | 578                        | 430                   | 5.90          | 4.39              | 469                           | 349               |
| 1974/75 | 620                        | 364                   | 6.20          | 3.64              | 379                           | 222               |
| 1975/76 | 806                        | 369                   | 7.90          | 4.70              | 263                           | 156               |
| 1976/77 | 1729                       | 1068                  | 16.47         | 10.18             | 200                           | 123               |
| 1977/78 | 933                        | 536                   | 8.72          | 5.01              | 752                           | 432               |
| 1978/79 | 1051                       | 591                   | 9.65          | 5.42              | 564                           | 317               |

a. Adjusted for inflation by converting into 1970-71 Rupees.

drive of the mid-1970s. The inflation-adjusted cost per equivalent sterilization started and ended near the same level (Rs. 306 and 317, respectively), but followed the opposite pattern, declining during the drives and increasing in the slack periods that characterized the years that followed. In general, then, program costs and efficiency appear to have remained essentially constant when allowance is made for the effects of inflation, the size of the population being served, and special, short-term intensifications of efforts.

The Sixth Five-Year Plan calls for spending Rs. 10.1 billion, which works out to an average annual outlay of Rs. 6.78 per MWRA (in 1971/72 rupees) as opposed to Rs. 5.67 in the Fifth Plan and Rs. 5.68 in the Fourth Plan -- an increase of 19 percent over funding levels in the 1970s. Trends in the early 1980s suggest that program performance, in terms of sterilization equivalents, is keeping pace with the increases in funding. A breakdown of the reported 1979/80 costs in relation to MWRA and equivalent sterilizations by state is shown in Table 15. It can be seen that the inputs per MWRA tend to be lowest in the lowest-performing states. The picture is more mixed for the higher-performing states. In terms of cost effectiveness ratios, there is a relatively consistent inverse relationship between cost per equivalent sterilization and overall state performance. However, it is not clear how accurate the cost figures are, since they omit state inputs. (Though the program is fully funded from central resources, some states do augment the central funding with inputs of their own.)

Other breakdowns of cost effectiveness measures are so complicated by problems of shared costs, hidden costs, and difficulties of attributing credit for performance levels that no attempt is made to provide further figures

**TABLE 15: EXPENDITURES PER MWRA AND PER EQUIVALENT STERILIZATION,  
1978-80 BY STATE**

| State             | Cost per MWRA | Cost per Equivalent Sterilization |
|-------------------|---------------|-----------------------------------|
| Delhi             | *             | *                                 |
| Maharashtra       | 10.02         | 327 (L)                           |
| Gujarat           | 18.36 (H)     | 390 (L)                           |
| Haryana           | 11.39         | 521 (L)                           |
| Kerala            | 17.99 (H)     | 597                               |
| Tamil Nadu        | 9.83          | 445 (L)                           |
| Andhra Pradesh    | 10.89         | 522                               |
| Punjab            | 9.52          | 451 (L)                           |
| Orissa            | 10.84         | 506                               |
| Himachal Pradesh  | 15.08 (H)     | 809 (H)                           |
| Karnataka         | 11.78         | 475 (L)                           |
| West Bengal       | 6.39 (L)      | 756 (H)                           |
| Madhya Pradesh    | 8.17 (L)      | 542                               |
| Assam             | 4.92 (L)      | 545                               |
| Rajasthan         | 7.17 (L)      | 656 (H)                           |
| Bihar             | 6.85          | 875 (H)                           |
| Uttar Pradesh     | 8.52 (L)      | 1034 (H)                          |
| Jammu and Kashmir | 9.92 (L)      | 837 (H)                           |
| India             | 10.80         | 549                               |

Source: Ministry of Health and Family Welfare (op. cit.).

Not available

H = High

L = Low

here. However, it can be asserted with some confidence that the Postpartum Program and Nirodh Marketing Program are considerably more cost effective (at least in terms of government inputs per equivalent sterilization) than the program as a whole. This information may not be very useful for guiding future funding for the postpartum program since it has little potential for further expansion (only a small percentage of births are in hospitals) but is important to support the government's commitment to expand the Nirodh Marketing Program in the foreseeable future.

#### FERTILITY EFFECTS

The weakness of the observed relationship between state-level contraceptive prevalence and crude birth rate, noted above, was probably due to state-level variations in the degree of deficiencies in the SRS estimates of crude birth rates. Another approach, also used by the MOHFW, for studying fertility effects of program performance, is to estimate the annual number of births averted by acceptors of each method. The resulting estimates of the numbers of births averted each year since 1970/71 are shown in Table 16. The number of births averted by sterilization tripled during the decade and the number averted by conventional contraceptives more than doubled, while the number averted by IUDs declined by almost one-fourth. Overall, the estimated number of births averted by program methods increased from about two million at the beginning of the decade to about five million at the end. The number of births averted since 1977/78 has been nearly constant at this level.

The estimates shown in Table 16 do not allow for the possibility that additional births have been averted by medical termination of pregnancy (MTP) since 1972, when MTP was legalized. There are two reasons for this. First,

**TABLE 16: ESTIMATED NUMBERS OF BIRTHS AVERTED, BY METHOD,  
1970/71 TO 1980/81 (NUMBERS IN THOUSANDS)**

| <b>Year</b> | <b>Sterilization</b> | <b>IUD</b> | <b>CC</b> | <b>Total</b> |
|-------------|----------------------|------------|-----------|--------------|
| 1970/71     | 1,400                | 330        | 188       | 1,917        |
| 1971/72     | 1,585                | 318        | 239       | 2,142        |
| 1972/73     | 1,957                | 300        | 274       | 2,532        |
| 1973/74     | 2,437                | 260        | 296       | 2,992        |
| 1974/75     | 2,463                | 232        | 335       | 3,030        |
| 1975/76     | 2,584                | 224        | 322       | 3,129        |
| 1976/77     | 3,068                | 241        | 414       | 3,723        |
| 1977/78     | 4,401                | 231        | 418       | 5,050        |
| 1978/79     | 4,329                | 206        | 393       | 4,928        |
| 1979/80     | 4,286                | 223        | 399       | 4,908        |

Source: Ministry of Health and Family Welfare (op. cit.).

the number of reported cases of MTP has been consistently low. For instance, the provisional estimate for 1979/80 (the highest number reported for any year to that time) was 358,000. Assuming about one-third of a birth is averted per MTP, the total number of births averted that year was about 119,000. This is only two percent of the estimated number of births averted by contraception that same year. Second, it is believed that there are several illegal abortions for every legal abortion, suggesting that many of the pregnancies that are terminated legally would have been terminated illegally if there had been no MTP program. If so, it is doubtful that the MTP program has had much effect on fertility during the 1970s.

If about five million births were averted in 1978/79, the crude birth rate would have been about 7.4 points lower than the level of about 43 per 1,000 which might have been expected in the absence of contraception provided through the program. A decline of 7.4 points implies a level of about 36 per thousand. It should be borne in mind that the crude birth rate is also affected by use of contraception not provided through this program and other factors, and the actual level may therefore be different from 36. For instance, the age at marriage has been slowly rising, and this trend probably has had a slight depressing effect on the crude birth rate. On the other hand, the incidence and duration of breastfeeding may well be declining, in which case potential marital fertility in the absence of contraception is probably rising. The extent to which these two effects are canceling each other in India cannot be ascertained. Nevertheless, there is a possibility that the decline in the crude birth rate by 1978/79, estimated above on the basis of program statistics, may be a fair approximation of the actual decline. These observations are consistent with the independent estimates based

on analysis of vital registration data, which show that the crude birth rate in 1978 was between 35 and 37. The nearly constant level of effective prevalence since 1977 suggests further that the crude birth rate has not declined much since 1978.

If the potential fertility of the users of contraception were equal to that of MWRA in general, the proportion by which fertility is reduced from its potential level without contraception would be equal to the proportion of MWRA effectively protected nine months before. In India, the effect of contraception on fertility is lower, since the program relies so heavily on sterilization, which tends to be used by older couples whose potential fertility is below that of MWRA in general. For instance, the estimated birth rate in 1978/79 indicates that fertility was about 17.6 percent lower than its potential level in the absence of contraception. This reduction was achieved with an effective prevalence level (nine months before) of about 22.7 percent on the average. This indicates that every percentage point of effective prevalence resulted in a fertility decline of about eight-tenths of a percentage point or a decline of about one-third of a point in CBR. However, the ratio of fertility reduction to further increases in prevalence will undoubtedly improve, because the mean age of contraceptive users has been declining and is likely to continue declining with increasing prevalence, which means that the average potential fertility of users will increase with time.

The effects of the program have continuously fallen short of fertility targets by a wide margin. Consequently, the fertility targets set have been revised downwards since 1962. Past performance creates doubts about the feasibility of achieving the ambitious targets set in the Sixth Plan (1980-85). The provisional figures for 1980/81 and figures for 1981/82 pro-

jected on the basis of the first nine months' performance indicate that acceptances by March 1982 will fall far short of the targets set in the Sixth Plan -- by 37 percent in the case of sterilization, by 32 percent in the case of IUD insertions, and by 29 percent in the case of conventional contraceptive use. As a result, the increase in estimated effective prevalence and resulting fertility change will also be slower than targeted.

#### KERALA: A CASE STUDY

Although the program performance data do not accord Kerala the highest prevalence of use of program methods, it stands out as the state with the lowest estimated fertility and the greatest decline in the intercensal growth rate. The ranking of Kerala below Maharashtra, Gujarat, and Haryana with regard to use of program methods may reflect a higher incidence of non-program use in Kerala than in most other states. This hypothesis is supported by comparison of the 1970 ORG survey with the 1972 program estimates of prevalence. The survey estimate of prevalence in Kerala was 27.0 percent, whereas the program estimate two years later was only 18.6 percent, a difference of 8.4 percentage points. In contrast, the corresponding differences for Maharashtra and Gujarat were only 3.5 and 3.6, respectively. (Figures for Haryana are not available from the survey report, but all other states except one had differences of less than four percentage points, some of them in the opposite direction. The one exception was West Bengal, where the program estimate was 9.7 and the survey estimate was 21.1 -- a difference of 11.4 percentage points.)

Kerala's low growth rate is particularly striking in light of the fact that it has by far the lowest infant mortality rate and highest life expectancy among the states. Moreover, the low rates of fertility and growth have

been attained in spite of the fact that Kerala is one of the poorest states in terms of per capita income. These inconsistencies have generated much interest, and Kerala is often looked upon as a potential model for other states since it demonstrates that poverty is not an absolute barrier to fertility reduction. Whether and to what extent the lower population growth rates in Kerala would contribute to a faster economic growth in the state or in improvements in the economic conditions of its people is yet to be seen.

Many factors have been proposed to explain the unusually rapid fertility decline in Kerala, of which the following seem to be especially plausible:

1. the highest literacy rate for both men and women; and a high government commitment to universal education, as evidenced by the allocation of 39 percent of the state budget to education and by concentration on the development of primary and secondary education rather than higher education;
2. the lowest infant mortality rate and high life expectancy; a strong government commitment to health, as evidenced by the allocation of 16 percent of the state budget to health services; and a stronger emphasis on preventive health services relative to curative services than in other states;
3. the relatively high status of women, which is reflected in their high literacy and in their high life expectancy relative to men;
4. concentration of 98 percent of the rural population in relatively large "villages" of more than 5,000 inhabitants (versus a national average of

only 762 in 1971), which facilitates access to government services; and relatively high utilization of health services and educational facilities compared with other states;

5. relatively late marriage, 21 for women versus 17 nationally, probably largely a result of female educational attainment and status; and
6. a high degree of government concern with equity considerations, which arises from a higher degree of political participation on the part of the citizenry.

The relevance of most of these factors for improving program performance or for a reduction in the rate of population growth in other states in a short period is questionable; but the relevance of the Kerala experience, especially of a rapid expansion of educational and health services, for achieving long-term goals in other states cannot be ignored. Efforts have been made in all states to increase literacy and educational attainment since independence; but not to the same extent as in Kerala. Consequently, the increase in literacy rates in other states has been slow. In the past 30 years, the national literacy rate has increased by less than 20 points, from 16.7 in 1951 to 36.2 in 1981. In the 1971-81 decade, the national literacy rate rose by 6.7 points. Even in Kerala, the increase was only 8.8 points; Kerala simply had a head start relative to the other states. If the present trend continues, it will be several decades before the national rate reaches Kerala's present level; but apparently there is no rational basis for the continuation of the present trend in the slow expansion of education and health services in other states.

The relatively high status of women in Kerala is probably a joint function of high literacy and several factors unique to the state, such as the fact that one cultural group formerly passed family property through the female line and that one-fifth of the population is Christian. The ability of health services to attract more clients per capita in Kerala than elsewhere probably results in part from the distribution of population, which makes it easier to place health centers and subcenters close to a larger proportion of the population. The level of political participation in Kerala and the concomitant concern with focusing government attention on improving the lot of the disadvantaged is also important. It thus appears that much of Kerala's success in reducing fertility can be attributed to unique circumstances. Nevertheless, important lessons can be learned from the Kerala experience. The extent to which this experience can be transferred to other states, and the means by which such a transfer may be accomplished, requires further scrutiny of state level organizations, commitment, and resources.

## VI. CONSTRAINTS

The Family Welfare Program in India has made important gains since 1966. Its experience with various interventions is rich both in quality and quantity. The program managers are committed to achieving the national demographic objectives by the end of this century, and many new steps are being taken. The program managers are convinced of the existence of high demand for contraception and perceive the lack of its availability as the major constraint to the achievement of national demographic objectives. Numerous KAP surveys conducted during the 1970s have contributed to this conviction. The magnitude of this unmet demand in the early 1970s was estimated to be around 40 percent of all couples with wives in the reproductive ages. For example, the 1970 national survey conducted by the Operations Research Group showed that about 52 percent of all couples said that they wanted no more children, yet only 22 percent of them were using contraception. This means that 41 percent (.52 x 78) of all couples said that they wanted no more children but were not using contraception to avoid additional births.

This index, however, grossly overestimated the magnitude of unmet demand. A further probing of couples' intentions about whether and when they were likely to use any family planning methods in the future reduced the magnitude of unmet demand to about 4 percent for irreversible methods and to about 15 percent for all methods. About 48 percent of all couples said that they were not likely to use any family planning method in the future; 24 percent were uncertain; 11 percent said they were likely to use contraception after having one or more additional children; and 4 percent said that they were likely to use a method "right away". The remaining 14 percent were

classified as current users. Corresponding figures from the 1980 survey, which are not yet available, will be of special interest, since the situation must have changed since 1970.

There is considerable room for error when estimating the magnitude of unmet demand from attitudinal questions about whether or not couples want additional children, and whether and when they are likely to use any family planning method in the future. The estimation of exact magnitude of unmet demand is irrelevant for public policy, but the variation from 15 to 41 percent (depending upon the definition) in its magnitude does warrant caution before taking the results at face value.

There is little doubt in our minds that some sizeable unmet demand for family planning methods exists in India and that the performance of the program can be improved. At the same time, we believe that the realization of the national objectives will also require identification of constraints that impinge upon the performance of the program from the outside. The first part of this section presents the major program constraints, and the second part discusses features of the social, cultural, and demographic setting that have limited the effectiveness of recent program efforts.

#### PROGRAM CONSTRAINTS

The major program constraints identified by the team on the basis of interviews and written materials include insufficient attention to a critical examination of the objectives of the program, and insufficient planning of program inputs and resources required to achieve these objectives; management deficiencies at all levels of the program; almost total reliance on sterilization; an incompletely developed commercial marketing system; only partial

staffing of the rural health infrastructure; poor quality of training and supervision; problems in interpersonal communications and inadequate informational materials; problems of contraceptive manufacture and distribution; and limited use of operations research and evaluation at state and national levels.

### Insufficient Planning

The objectives of the Family Welfare Program are currently set in terms of targets for numbers of acceptors and prevalence of each specific method offered through the program. These targets are set in relation to desired fertility levels without sufficient regard for the availability of resources, commitment of officials and workers, receptiveness of the eligible population for services, or past performance. Overambitious acceptor targets set in the past may have had negative influence on program performance by demoralizing program staff and may also have reinforced the tendency of program managers and workers to focus attention more on numbers of acceptors than on the quality of services. There is a real question about the objective of the Family Welfare Program; should it continue to be defined in terms of acceptor targets or redefined in terms of making information about and services for contraception more widely available? An emphasis on the quality of services rather than on numbers of acceptors is quite likely to contribute to improvements in program performance.

Program managers give insufficient attention to the planning concept. This is ironic, since the program itself aims for the acceptance of the planning concept by the masses. Insufficient planning of various program inputs, including financial and personnel resources, is an important constraint to

achieving program objectives whether they are set in terms of quality of services or numbers of acceptors. The projection of program performance in a vacuum may not be a fruitful exercise. However, the projection of program performance based on anticipated changes in program strategies and inputs, and on an analysis of past performance in relation to program inputs can be useful for identifying gaps between objectives and anticipated performance, and for identifying modifications in program strategies required to achieve the program objectives.

Since the Family Welfare Program is centrally funded, its implementation tends to be determined primarily at the central level. The resulting uniformity of program inputs does not counteract the effect of other factors that contribute to the differences among the states in level of performance. The implementation strategy that has produced relatively high performance levels in Maharashtra and Gujarat has not succeeded in Bihar and Uttar Pradesh. While it might appear reasonable to continue with the successful strategy in the high-performing states, it appears necessary to make radical changes which are directly responsive to the special problems in the low-performing states. This might require a substantial increase in the allocation of resources to the former. The need to find state-specific solutions to the problem of low performance is particularly urgent in Uttar Pradesh and Bihar, where 28 percent of the eligible couples in India live and where the prevalence rate is less than half that of the other states.

In some states, poor performance may be due largely to insufficient commitment of the state government to the program arising from the lack of participation of state officials in its design. If state governments could be induced to play a more active role in designing their own family welfare pro-

grams, they might make greater efforts to ensure their success. This same principle is probably applicable at all levels: district managers will be more committed to successful implementation of plans that they have had a part in designing, as will the personnel of PHCs and subcenters, and village leaders.

### Reliance on Sterilization

Since its inception, the Indian Family Welfare Program has relied on sterilization. In the early years, this emphasis may have maximized program effects. However, at the present stage of development, continuation of such an emphasis will be an important constraint to achieving the rapid increases in prevalence of contraception. In fact, the ultimate target of 60 percent prevalence cannot be achieved by sterilization alone or even by sterilization predominantly. It is doubtful that sterilization prevalence could ever be raised beyond 40 percent, and it seems likely that the maximum level will prove to be lower.

As an irreversible method, sterilization is useful only for couples who are ready to cease childbearing altogether. In India, with its high infant and child mortality levels, most couples are not willing to use an irreversible method after having only two or three children, even if that is their desired family size, for fear that one or more children may die and may need to be replaced. Thus, sterilization is not an acceptable method, even for many who may be ready to limit the size of their families.

Though Nirodh and the IUD have been available as program methods for years, neither has been made widely available nor used by very large proportions. At present, only one percent of the eligible couples are using the IUD

and no more than four percent are using Nirodh. In contrast, about 21 percent are sterilized.

The Lippes loop has never attained a high level of popularity. However, there appears to be great interest in the Copper-T at present, and the demand for this device is said to far exceed existing availability. If true, it presents an important opportunity for the program to achieve major increases in the use of contraceptive methods for spacing and in the use of more effective reversible methods by limiters who reject irreversible methods.

Expansion in the availability of oral pills appears to present a greater problem. There is a pervasive resistance among medical professionals to oral pills and a belief that some urban women will resist using them due to side effects and fears about major health consequences. The team was also informed by some medical persons that rural women have difficulty remembering to take a pill every day, but no one was able to point to hard evidence supporting this assertion, which appeared to be more a stereotypic prejudice than a well-established, empirical fact. Perhaps joint efforts to increase the motivation of doctors to promote pill use and to dispel fears about health effects could be employed to increase the acceptability of this method. A major constraint to widespread use of pills is the requirement that pill acceptors be examined by a doctor. Since most of the doctors in rural areas are men, many potential pill acceptors will resist undergoing pelvic examinations.

The availability of some types of contraceptive supplies is also limited by restrictions on who may provide them. Prescription of oral pills has been the sole responsibility of physicians. Though ANMs have been authorized to provide initial prescriptions for up to three months, subsequent use

of pills could be continued only after examination by a physician. The team has been informed that the Village Health Guides will soon be authorized to prescribe pills on the same basis as ANMs. Such a change will probably have relatively little effect on actual practice in many areas since the same factors that presently prevent potential pill acceptors from being seen by a physician before acceptance will probably continue to prevent them from being seen within three months after initial acceptance from an ANM or VHG. ANMs who have been trained in IUD insertion are not permitted to perform IUD insertions on their own for the first few years after their training, while they gain experience either through assisting senior paramedics or doing supervised insertions. Persons authorized to insert the Lippes loop are still not authorized to insert the Copper-T until they have undergone special training, despite the similarity of the two types of insertion.

Although medical termination of pregnancy is not a contraceptive method, it is an important adjunct to reversible methods in the event of accidental pregnancy. Presently, only physicians are permitted to perform MTP, a restriction which makes it unavailable to much of the rural population. This restriction is intensified by the lack of female doctors in rural areas, since some women might resist having MTP performed by a male doctor.

Efforts to establish depot holders for the distribution of Nirodh have not been very successful in the past but are being tried again using the VHGs. Logistical problems are likely to present difficulties in this effort, given the numbers of VHGs already trained and to be trained. Nirodh has also been distributed through commercial channels; sales, however, have been largely limited to urban and semi-urban areas.

## Incompletely Developed Commercial Marketing System

The Government of India launched the Nirodh Marketing Program in September 1968 to increase the use and distribution of Nirodh Condoms through the distribution networks of the country's six largest marketing companies. The objectives of this program were:

1. To create a large-scale primary demand for Nirodh.
2. To accomplish nationwide sales through modern marketing techniques.
3. To price the product at a very low level (subsidized by the government) and make the user perceive it as an everyday necessity like "soap and tea."

The full potential of this very important initiative has not yet been realized. It is necessary to thoroughly analyze past experience in order to identify constraints and take remedial actions to achieve the objectives.

The primary sale of Nirodh, that is, the sale from the government to the marketing companies, increased from 16 million condoms in 1968/69 to 116 million in 1973/74; dipped to a low of 64 million in 1974/75; increased up to 140 million in 1977/78; and decreased again to 78 million in 1979/80. The sales figures of 130 million in 1980/81 and 160 million (projected) for 1981/82 indicate substantial improvement, provided this is not followed by the low level cycles observed in earlier years.

There are good reasons for the erratic pattern depicted by the primary sale of Nirodh in the past. The peak achieved in 1973/74 represented overstocking prior to increase in the price. In 1974/75, not only was the consumer price increased from Rs. 0.15 to Rs. 0.25 for a packet of three condoms,

but the publicity campaign for Nirodh was completely stopped. The peak of 1980/81 reflected a change in leadership at the Ministry and increased involvement of chief executives of the marketing companies.

Publicity for Nirodh was resumed in 1976/77, but as a component of the overall family planning program. The marketing companies, responsible for distribution, are not involved in developing publicity material, which is done through the Ministry of Information and Broadcasting. Frequently publicity materials are not available in areas where distribution and sale of condoms are being intensively promoted through special bonus offers and related activities.

Inadequate use is made of the information generated through the retail store audit surveys carried out by the Operations Research Group. These surveys provide quarterly and annual estimates of total consumer purchase and distribution by population size of towns, type of retail outlet, and geographic zones in the country. A trend analysis of consumer purchase rather than primary sale alone would provide a better indication of changes in consumer demand for Nirodh. Similarly, analysis of changes in consumer sales through various outlets, in different geographic areas, and in different population size categories of cities and towns, along with alterations in advertising campaigns and marketing strategies, is important for understanding varying market conditions and for planning. The planning for the future should also be facilitated by the results of the national surveys conducted by ORG. Emphasis should be given to understanding changes between 1970 and 1980, and their probable causes.

## Partial Staffing of Health Infrastructure: Personnel Recruitment and Retention, and Poor Motivation

At all levels and in all areas of program activities, the recruitment and retention of qualified personnel appear to present a major problem. Many sanctioned positions remain vacant. This problem is particularly serious at the field level, especially in rural areas. In 1979, for instance, 39 percent of the sanctioned positions for rural family welfare health assistants and 24 percent of the sanctioned positions for female health visitors remained vacant. The vacancy rate for medical officers and block extension educators was lower (13 percent) but still high enough to cause concern. Though auxiliary nurse/midwives were not in such short supply (96 percent of the sanctioned positions were filled), the vacancy rates for higher-level personnel probably affected the quality of supervision and the availability of support services. Furthermore, vacancies among "computers" (31 percent) and storekeepers (17 percent) probably forced medical and paramedical workers to divert some of their time to routine clerical functions, time they might have used to provide services.

In addition to the general problem of attracting qualified medical and paramedical workers to rural areas, the program faces the problem in some areas of providing suitable accommodations for such workers, especially female doctors, who are preferable to male doctors for doing pelvic examinations and IUD insertions.

It has been observed that many of the family welfare workers appear to be less concerned with providing an important service than with simply doing a job to earn money. This orientation is reflected in the tendency of many to focus almost exclusively on trying to persuade people to undergo sterilization

rather than educating couples about the variety of contraceptive options available to them and helping them select the most appropriate ones. This problem is undoubtedly exacerbated by the fact that motivators are offered bonuses for successful referral of sterilization clients but not for acceptors of other methods. It may also stem from an overemphasis on sterilization in training and on quantity rather than quality of services in supervision and evaluation of their work. Low salaries at all levels probably affect motivation. Even Village Health Guides, who are nominally volunteer workers but receive an honorarium of Rs. 50 per month, consider themselves underpaid in relation to the broad range of functions they are expected to perform.

#### Inadequate Supervision

Inadequate supervision is often cited as a weakness of the program's field activities. The problems of vacant supervisory positions and the focus on quantity rather than quality have already been noted. In addition, it has been asserted that inadequacy of transportation facilities for supervisors limits the frequency with which they can directly observe and guide the workers for whom they are responsible. The time available for supervision is often limited, since the supervisors are themselves primarily responsible for other activities. Village Health Guides are supervised by subcenter ANMs, whose chief responsibility is to provide services at the subcenter and who therefore have little time to spend on supervision. Subcenter personnel are supposed to be supervised by PHC personnel, who in turn have their own medical and paramedical functions to perform. Furthermore, the quality of supervision suffers from a lack of emphasis during training on developing supervisory skills.

### Problems in Production and Distribution

Problems with the production and procurement of contraceptives restrict their availability to the people. The number of condoms distributed by the program each year has been approaching the limits of current production capacity, and this may have inhibited wider use in some areas. Problems with quality control in the production of Lippes loops were reported, and these problems may have affected the acceptability of this method to both service providers and clients. Demand for the Copper-T was reported to have exceeded existing supplies in many areas. We do not know whether the production and procurement procedures for oral pills are adequate to even fill the supply channels in the expanded program of distribution.

It is widely noted that many workers and family welfare centers lack adequate supplies or equipment for providing contraceptive service. The team was not shown quantitative figures, but the frequency with which program officials and others noted this problem in discussions suggests that it is widespread. The very lack of quantitative data suggests that the movement of supplies may not be monitored systematically enough to prevent widespread shortages. This problem may help explain the low rates of acceptance and use of methods that require resupply. As reversible methods begin to be used by large proportions of eligible couples and as the numbers of subcenters and VHGs continue to grow, the logistical problems are bound to increase greatly. It is doubtful that the present logistics system will be able to cope satisfactorily with such increases.

## Problems in Interpersonal Communications and Inadequate Informational Material

Interpersonal communication is recognized by program managers to be the most important communication channel for motivating couples to use contraceptive methods. In the past, the little available research evidence has indicated disturbingly small proportions of couples reached by program workers, especially in low-performance states like Bihar. This problem may be reduced by the ongoing effort to train one Village Health Guide for every thousand persons in the rural areas. However, at the present rate of training (about 200,000 VHGs trained in the first four years) it will take about a decade to reach the goal of one per thousand, allowing for population growth and replacement of VHGs who drop out.

Furthermore, simply placing VHGs in the villages is not going to ensure that those couples most in need of information about contraception are adequately covered. The motivation of VHGs will need to be particularly strong to ensure that they play an active role, making home visits to inform and motivate potential acceptors rather than waiting for villagers to visit them. Such motivation may be difficult to maintain over a long period of time, even with the encouragement of the community leaders who select them. Moreover, they need to place highest priority on reaching couples, especially wives, who are least likely to be seen by other program workers or to have access to the mass media: the illiterate, the poorest, the most remote. The need for setting such priorities does not appear to be emphasized at present. Moreover, the policy of leaving the selection of VHG trainees to the village panchayat may, in some areas, serve the interests of the village elites rather than the needs of the relatively disadvantaged members of the community.

In recent years, it has been increasingly recognized that the program needs to promote more use of female methods, particularly the more effective reversible methods, for those couples who are prepared to practice contraception but not to take the risk involved in having an irreversible operation. As a result, current policy calls for selecting women rather than men to be VHGs. However, in areas of low female literacy, a large proportion of the VHG trainees continue to be men, since none of the female residents is deemed capable of satisfactorily completing training or using the VHG manual.

The program produces and disseminates a variety of mass media materials. However, these do not play an important role in the recruitment of acceptors or in the maintenance of continuing users. The radio coverage is reported to be high and the radio is used for promoting family planning, but it is better suited for stressing the advantages of small families than for informing people in detail about the methods available, where they can be obtained, and how they can be used. Posters, billboards, and the like are inappropriate for much more than conveying slogans. Leaflets, booklets, and advertisements are used for providing detailed information, but such materials tend to be directed at relatively well-educated, urban couples. Moreover, the printed materials are generally printed in small quantities. For instance, the currently used Hindi-language leaflet on the IUD was printed in January 1981 with a press run of 180,000 copies. In contrast, there are over 40 million Hindi-speaking eligible couples. There are no non-verbal, pictorial printed materials prepared specifically for illiterate or semi-literate couples.

The capacity of the communication program is constrained by a lack of both financial and personnel resources. Only three percent of the Family Wel-

fare budget under the current Five Year Plan is allocated for "media and extension," excluding staff costs. Of the sanctioned communication staff positions at the state, district, and block levels, only 78 percent are filled. At the state level, only one-third of the health education officers and technical staff and two-thirds of the State Mass Education/Media Officers are in place. The shortages of both funds and personnel for communications at the state level undoubtedly inhibit the capacity of many states to design materials specially suited to local conditions.

#### Limited Use of Operations Research and Evaluation

Though there is general agreement that management of the program is not as strong as it might be, much of the assessment of the program's strengths and weaknesses has been based more on impressions and hearsay than on systematic research. Before the 1970s, program-related research tended to be limited to small-scale KAP studies that yielded little useful information for guiding program managers interested in improving service and support systems. Invariably, results of these surveys misled program managers into believing in the existence of a high unmet demand for contraception. Since 1970, there has been increasing emphasis on managerially useful research. Surveys of eligible couples have gone beyond the conventional KAP fertility questions, inquiring about exposure and response to program messages, personnel, and services. Surveys of service providers and opinion leaders have been conducted to provide a different perspective from that obtained from surveys of eligible couples. Surveys of acceptors have been conducted for studying continuation and termination of contraceptive practice, and reactions to program services and the methods available. In-depth surveys, non-survey methods

and qualitative analysis of processes have been increasingly used to augment conventional surveys. However, the usefulness of this research, especially at the central level, has been limited by fragmentation, slow feedback, and lack of accessibility of results.

The problem of fragmentation lies in the fact that most studies have been of relatively small geographic scope, based on small samples, and performed by relatively small, regional research centers. The analysis has often been inconclusive owing to small sample sizes, and the generalizability of the results has been limited by small geographic scope. Since many of the regional research institutes are at an early stage of development, the quality of analysis and its relevance for managers has not always been very high. Some of the larger-scale, more useful studies have suffered from long delays between the time of data collection and the publication of results. For instance, the analysis of a particularly useful study conducted in the important state of Uttar Pradesh in 1971-72 has been published only in 1982. The problem of accessibility is an outgrowth of the problems of fragmentation and slow feedback. There is currently no clearinghouse to monitor the status of ongoing research; retrieve research reports; inform researchers, program managers, and other population specialists of their availability; or attempt to abstract and synthesize findings and implications. In the late 1970s, the MOHFW initiated publication of a semiannual Population Research Bulletin, which abstracted recent research findings, but the last issue (Vol. II, No. 1) was dated December 1979. However, the Ministry intends to revive this potentially useful publication in the near future.

The Ministry's capacity to monitor and utilize the results of research is constrained by the limited staff size of the Evaluation and Intelligence

Division at the Central level and its state counterparts, the Demographic and Evaluation Cells. At both levels there are numerous vacancies. At the state level, only five out of 27 sanctioned social scientists are in place; 15 out of 27 demographers; 65 out of 111 statisticians, statistical assistants, and statistical consultants; and 43 out of 199 field and evaluation workers. Furthermore, the research skills of many of the personnel presently in position are in need of upgrading. With most of the time of the existing staff focused on implementation and checking of the recording and reporting system, little time is left for extensive involvement in either the design of research or the assessment of findings and their implications for management.

#### EXTERNAL CONSTRAINTS

India is famous for the richness, strength and diversity of its social settings. In any locale, behavior which affects fertility is influenced by perceptions, beliefs, long-standing traditions, prevalent practices and social structure. An emphasis on male preference in India affects the status of females as the producers of children, as candidates for receiving an education, and as candidates for possible employment opportunities.

Age-at-marriage is the result of a complex of behavior patterns related to concepts of propriety, caste structure, kinship alliances and other variables. Similarly, there are community expectations about childbearing after marriage; cultural variables influencing postpartum sexual activity; and patterns and beliefs surrounding the duration of lactation. The acceptability and popularity of methods of contraception are also affected by the cultural setting. Concepts of the source of strength and the foundations of virility, for example, may affect the acceptance of vasectomies.

In addition to constraints of the family planning program which limit the availability of services and information about a variety of contraceptive methods and induced abortions, many other factors restrict the utilization of available services. However, the sociocultural factors and behavior patterns which influence fertility and program performance are not well understood. Much of what is thought about or credited to these sociocultural variables represents only informed guesses. They will remain so until systematic research into these factors (particularly in rural areas) is completed. Available information suggests that the factors which influence fertility and program performance include persistently high infant and child mortality, low female education, lack of women's participation in economic activities, continued importance of and reliance on children and especially sons, and economic conditions of couples. The importance of some of these factors for fertility behavior is illustrated below.

#### Persistently High Infant and Child Mortality

The mortality level of children, especially infants, remains high in India. The infant mortality rate was estimated to be around 132 in 1974-76. It varied from 55 in Kerala to 185 in Uttar Pradesh. High infant mortality is considered to be one of the constraints for achieving small family size. It should, however, be recognized that there is a two-way relationship between the level of infant and child mortality and fertility. High birth order is one of the factors associated with high infant mortality. A decrease in fertility through reduction in the proportion of high-parity births can decrease infant mortality independent of improvements in birth weight and nutrition.

A decrease in infant and child mortality can have an immediate effect on fertility through biological mechanisms. For example, early child death curtails the period of breastfeeding and, therefore, shortens the birth interval. A decrease in infant mortality can suppress current fertility by increasing the duration of breastfeeding. The effect of a decrease in infant and child mortality on total family size, especially total number of surviving children, is uncertain. Two types of effects are usually identified: the replacement effect and the insurance effect. The replacement effect refers to the replacement of the child who died. This effect is likely to be important for families who have experienced the death of a child. The insurance effect refers to the excess fertility required to compensate for the potential loss of children. This effect is likely to be important for all couples and likely to depend upon their own experience with child death and their perceptions of the general level of infant and child mortality in the community. Empirical studies in the past have usually concentrated on the replacement effect, and the evidence has been of a mixed nature. It is, however, suspected that a substantial decrease in infant and child mortality would change parents' perceptions about the general level of mortality in the community and thus would decrease fertility in the long run.

#### Low Female Literacy and Education

The overall literacy level in India has been increasing since independence. Female literacy has also increased from about eight percent in 1951 to about 25 percent in 1981. Even at this low level of overall literacy, there is a considerable variation between states. Female literacy in 1981 ranged from 11-14 percent in Bihar, Rajasthan, and Uttar Pradesh, to 65 per-

cent in Kerala. The low level of literacy among females is one of the most if not the most important constraint for achieving the goal of small family size.

The level of female education in many developing countries including India has been shown to be negatively associated with fertility. There are some exceptions, more likely to be due to deficiencies in the measurement of education and of fertility rather than to education itself. The results of the surveys conducted by the Registrar General's office in 1972 and 1978, summarized in Table 17, confirm this relationship for India. The observed relationship between education and fertility is the net result of effects of education on the age at marriage, the use of contraception, and the duration of breastfeeding (the first two effects leading to lower fertility, the third to higher fertility since increased education is associated with decreased duration of breastfeeding). Moreover, the demand for children has always been shown to decrease with advancements in female education. There are two competing hypotheses.

According to one explanation, additional education increases a woman's chances to participate in the paid labor force in the modern sector. Potential trade-offs might be created between time spent on childbearing and rearing on the one hand, and economic and other gains perceived from working in the modern sector on the other. These trade-offs are likely to exert downward pressure on individual fertility. But education in the absence of increases in opportunities to participate in the modern sector may not create downward pressure on individual fertility. According to the second explanation, education enhances a woman's status within and outside the immediate family and increases her chances to be exposed to mass media and especially to printed

TABLE 17: FERTILITY RATES BY SELECTED CHARACTERISTICS

| Characteristics                                | Total Fertility Rate <sup>a</sup> |       |       |       | Total Fertility Rate |       |
|--|-----------------------------------|-------|-------|-------|----------------------|-------|
|  | 1972                              |       | 1978  |       | 1978                 |       |
|  | Rural                             | Urban | Rural | Urban | Rural                | Urban |
| <u>All Women</u>                               | 6.8                               | 6.0   | 5.6   | 4.7   | 4.6                  | 3.1   |
| <u>Level of Education</u>                      |                                   |       |       |       |                      |       |
| Illiterate                                     | 6.9                               | 6.3   | 5.5   | 4.5   | 4.7                  | 4.2   |
| Literate                                       | 7.1                               | 5.0   | 5.0   | 4.5   | 3.4                  | 3.1   |
| Primary  |                                   |       | 4.9   | 4.1   | 3.4                  | 3.6   |
| Matric +                                       | 5.0                               | 4.5   | 5.0   | 3.8   | 3.5                  | 3.2   |
| <u>Per Capita Monthly Expenditure (Rupees)</u> |                                   |       |       |       |                      |       |
| Below Rs. 20                                   | 7.5                               | *     | }     | 6.2   | 6.0                  |       |
| 21-50  | 6.8                               | 6.6   |       |       |                      |       |
| 51-100   | 5.8                               | 4.3   | 4.8   | 4.6   |                      |       |
| 100+   | 2.4                               | 2.5   | 3.4   | 2.7   |                      |       |

Source: Registrar General and Census Commissioner, India. Fertility Differentials in India, 1972 and Survey on Infant and Child Mortality, 1979: A Preliminary Report. Ministry of Home Affairs, New Delhi.

\* Small number of cases.

a. Fertility rates for 1978 are underestimated and, therefore, these results overestimate the decline in fertility between 1972 and 1978.

material. This reduces her isolation and broadens her circle of contacts, which in turn are conducive to changes in her general outlook and behavior, including fertility. A recent analysis of the relationship between education and fertility in eleven developing countries provides support for the second explanation. This effect is especially important in a country like India, where in 1970 only five percent of women in the childbearing age group were exposed to printed material through newspapers and periodicals, and only 28.5 percent were exposed to any one of the three media -- press, cinema, and radio. This means that advances in female education, even up to the primary level, can be expected to have a negative influence on fertility. This can happen even in the absence of a simultaneous increase in the potential opportunity for employment.

#### Low Status and Economic Role of Women

Children, especially sons, are believed to enhance women's status within and outside the household. A number of factors affecting women's status are changing gradually. In addition to female education, enhancement of women's economic role is likely to improve their status and contribute to downward trend in fertility.

The presumed effect of the economic roles of women on their fertility involves various assumptions: (1) explicit decisions are made at the household level about various aspects of life such as allocation of financial resources for consumption, saving, and investment in the development of human resources through improvements in the quality rather than the quantity of children; (2) women are more likely than men to invest in development of human resources; (3) women's access to and control over financial resources

both within and outside the family would increase their relative role and power in decisionmaking within the household; and therefore, (4) increase in women's access to and control over financial resources is likely to decrease their subsequent fertility. If so, such measures as creation of employment potential for women and increasing their access to credit, marketing, and other means of production would enhance their participation in the paid labor force and enhance their access to and control over financial resources, which in turn would decrease their subsequent fertility.

#### Continued Importance of and Reliance on Children

The demand for children is commonly assumed to be determined by the balance between the total cost and benefits of children to parents. The word "total" includes the actual and perceived economic as well as psychological and social costs to parents, and benefits derived by them. In developing societies like India, high fertility is explained on the assumption that benefits derived from children are usually higher than the costs involved in raising them. It is further assumed that a decrease in benefits including utility of children and/or an increase in costs of raising them would lead to a decline in the demand for children and a subsequent reduction in fertility. These two sides of the equation have various components, which have received different emphasis in the literature. This has generated various specific assumptions about the importance of each of the components.

According to one explanation, children, and especially sons, are seen as important for old-age security, i.e., parents want to have at least one surviving son by the time they reach old age. Sons in old age are deemed important for economic as well as non-economic reasons including the perfor-

mance of religious rites. Four to five births may be necessary, on an average, to have one son surviving to adulthood, because about 50 percent of births are boys, and because of high infant and child mortality. Thus, a substantial decline in infant and child mortality, and provision of old-age security, may lead to a reduction in fertility.

Another hypothesis deals with parents' reliance on children as a form of insurance against the level of environmentally and socially determined risk. A decrease in the level of risk to parents through such programs as the guaranteed employment scheme in Maharashtra and increase in the availability of such mechanisms as credit and other cooperatives to deal with these risks are likely to decrease parents' reliance on children and to reduce their subsequent fertility.

### High Poverty

The government has defined the poverty level in terms of assumed minimum nutritional requirements and the minimum expenditure required to meet these requirements of 2,400 calories per person per day in rural areas and 2,100 calories for urban areas. These caloric requirements are equivalent to a per capita monthly expenditure of Rs. 65 for rural areas and Rs. 75 for urban areas (1977/78 prices). About 48 percent of the people were estimated to live below the poverty line. This varied from 15 percent in Punjab to 66 percent in Orissa.

The relationship between poverty and fertility is demonstrated by the observed association between fertility measures and per capita monthly household expenditures. The measures of current fertility, based on children born in one year prior to the survey by per capita monthly expenditure, are shown

in Table 17 for 1972 and 1978. These data indicate that fertility is inversely related to per capita monthly expenditure. The total marital fertility rate in both rural and urban areas decreased significantly with an increase in per capita monthly expenditure in 1972 as well as 1978.

Persistence of high poverty can influence fertility (number of live births) through various mechanisms including a demand for more children, high infant and child mortality, and the lack of accessibility to contraceptive methods among poor people. The available data are not sufficient to make these distinctions, which is important for planning interventions to reduce fertility.

In sum, fertility is likely to decrease with a decrease in infant and child mortality, an increase in female education, an increase in the economic role of women, a decrease in the economic value of children, and improvements in the economic conditions of the poor. The relative importance of these factors, however, is not known. Moreover, there are inherent differences in the time dimension in which fertility effects of changes in these factors could be expected. Measures to decrease the economic value of children, to increase the economic role of women, and to improve the economic conditions of the poor are important in influencing fertility levels of couples already in their childbearing period or who will be starting their childbearing in the near future. Measures to decrease infant and child mortality and to increase education of girls can have some immediate effect on fertility; but are really important in influencing fertility of couples who will be starting their childbearing in about ten years. The alleviation of these external constraints will create more favorable environments for the adoption of small family size behavior.

## VII. DIRECTIONS FOR THE FUTURE

The future course of fertility in India will depend upon what happens to marriage patterns, the prevalence and duration of breastfeeding, the adoption of contraception including sterilization and abstinence, and the prevalence of induced abortions. The provisional figures for 1980/81 and figures for 1981/82 projected on the basis of the first nine months' performance indicate that achievement by March 1982 will amount to only 63 percent of the original Sixth Plan target for sterilizations, 68 percent for IUDs, and 71 percent for conventional contraceptives. One option is to revise downwards the targets set in the Sixth Plan. This has been done in the past and may well be done in the future, especially if the shortfalls continue to accumulate with time, but at present the mood is optimistic and government officials indicate strong commitment to the desirability of achieving the demographic objectives set in the Sixth Plan.

There is a strong need to analytically examine the feasibility of achieving these demographic objectives, to review available options, and to set the future directions to achieve these objectives. Since program activities can do very little to influence the demand for children, marriage patterns, or the prevalence and duration of breastfeeding, it may be necessary to reconsider the roles and responsibilities of the Family Welfare Program. Perhaps the responsibility of the Family Welfare Program can be defined as making widely available the information about and services for contraceptive methods and induced abortion. The achievement of national demographic objectives, perhaps, should be defined as the overall responsibility of the Planning Commission or some other organization like it. Such a demarcation

would make sense because much more needs to be done to make the services available with an emphasis on their quality. This is essential for achieving the quantitative targets.

## PROGRAM IMPLEMENTATION

### Public Sector

If the targets set for the next two decades are to be met, there is a need to estimate the inputs required to achieve them. The resource allocations specified for the remainder of the Sixth Five Year Plan are likely to contribute to an increase in prevalence between 1982 and 1985, but it is doubtful that the effective prevalence level will increase by more than one or two points per year, reaching about 27-30 percent by 1985, without a radical intensification of program efforts. For the longer term, a more rapid acceleration of performance will require not only monetary resources but the careful development of a more solid foundation of managerial capacity, technical expertise, and commitment of personnel at all levels to promoting the health and welfare of all their clients, especially the most disadvantaged.

There is a need for enhanced management capacity at all levels. In terms of high-level management, the need is greatest at the state level, since each of the state ministries must manage a large bureaucracy and contend with unique cultural, geographic, and social conditions that require modification of central guidelines for program strategy in order to maximize effectiveness and efficiency. In terms of lower-level management, it is most important to increase supervisory skills at the PHC level and below. Workers at the sub-center and village levels need to be systematically trained in personnel management techniques, which will enable them to set priorities among their tasks

and systematically organize their time so as to maximize their coverage of the population to be served, especially those segments most in need of information and services. Supervisory procedures should be designed to reinforce such training and assess quality of work instead of or in addition to achievement of quantitative targets.

With its heavy reliance on sterilization, the Indian Family Welfare Program has primarily served the needs of those couples who have already had enough children to take the risk of choosing an irreversible method. A large potential demand for reversible methods probably exists for couples who reject sterilization because they may want to have more children later on. So far, the actual acceptance of reversible methods has been disappointingly low, but this may be because they have not been made widely available or emphasized to the same degree as sterilization. Furthermore, the potential acceptors may not be the only ones who need special motivation. Many program officials and workers believe that the IUD has already proved to be unacceptable in the past and that the oral pills will also be unacceptable. With such an attitude, officials may not make a great enough effort to overcome the expected resistance to acceptance of such methods. The condom has numerous disadvantages, but the Nirodh program, with its imaginative and vigorous promotional campaign, has been able to attract many times more acceptors than programs for either pills or the IUD. It has been found in many programs that acceptance of modern, clinical methods is determined to a large extent by the attitudes of the medical and paramedical persons responsible for providing them. If the doctors and ANMs can be convinced of the importance of promoting pills and the IUD, it is likely that their acceptability among eligible couples can be greatly increased as well.

A major need is increasing the ratio of clinical and field personnel to population as rapidly as possible. The rate of training of VHGs needs to be accelerated if the target of one per 1,000 rural population is to be reached before the end of the decade. In addition, it appears likely that many medical and paramedical posts, especially in rural areas, will remain unfilled in the absence of special efforts to make assignment to such posts more attractive, especially for female workers.

In addition to increasing the numbers of paid and volunteer workers, it is necessary to make greater efforts to improve the orientation of workers to their work. The present emphasis on maximizing the numbers of acceptors, especially of sterilization, without regard to their characteristics or needs, should be replaced by a more systematic strategy of identifying the couples most in need of services and going through the various methods of contraception with them, helping them to select the one most appropriate and acceptable to them. Such a reorientation of perspective could be introduced through modifications in the training curricula and strengthened through changes in supervisory procedures.

Communications support materials need to be made more widely available, especially in remote rural areas. This applies particularly to printed leaflets and booklets that can be given to acceptors (for instructions on use of the method accepted, for reference, and for showing to friends and relatives) or potential acceptors. If such materials were redesigned to incorporate more pictures and fewer words, they would be much more attractive and useful to less educated and semi-literate persons than the existing materials. The quantities of such materials would need to be greatly increased to reach a substantial proportion of couples. If the goal were to provide ten percent of

all couples with copies of a particular leaflet, over four million copies would be required in Hindi alone.

In addition to providing greater quantities of detailed communications support materials, it is important to link these materials with interpersonal communication as much as possible. The two approaches naturally complement each other. The support materials may provide the message in a more accurate, carefully packaged form, but interpersonal communication is much more immediate and provides an opportunity for the recipient to ask questions and for the communicator to allay fears and objections. Broadcast and printed materials could be designed in such a way as to augment interpersonal communication. Group meetings could be scheduled to coincide with radio broadcasts, which could be used to stimulate discussion. Printed materials could be used as visual aids during home visits and then left with the couple for further reference or to be shared with others. Such an approach would even permit the production of printed materials for illiterates, composed entirely or almost entirely of pictures. The field worker could explain the meaning of the pictures, which could then be left with the couple to help them remember what they had been told.

The unevenness of the centrally-designed program's performance in the various states indicates a need to diversify the program, tailoring strategies and resource inputs to the particular conditions in individual states. Given the high cost of recruiting acceptors in Uttar Pradesh and Bihar, for instance, it appears necessary at least for the short run, until a more cost-effective approach can be found, to spend proportionately much more money than in other states in order to bring performance up to the average level of the other states. This idea has been proposed before, but it has not been tried

to an appreciable degree because it was felt that it would be rewarding in efficiency. However, considering how low the performance is in these two states and how large a proportion of the total population they represent, the central government cannot expect the national fertility rate to decline steeply enough to meet the targets for 1985 and 1996 without a substantial and rapid improvement in their performance. The area projects in a few districts of these states represent a good step in this direction, and the early experience there should provide useful feedback on innovative strategies likely to be relatively effective and efficient. However, the need for a rapid improvement in these states suggests the need to expand the area projects to cover as many districts as feasible given available resources, especially in states that have shown the poorest performance.

The principle of diversification of program inputs and strategies does not apply only to Uttar Pradesh and Bihar. In the more successful states, it is likely that the state health ministries, being relatively highly committed to their work, would be particularly interested in innovating and that such innovations would tend to enhance effectiveness and/or efficiency. The principle of two-way communication -- upward as well as downward -- could be applied at all levels, with states having greater opportunity to deviate from centrally prescribed strategies, districts having greater opportunity for deviating from state strategies, and so forth. The advantage of such flexibility would be twofold: the strategies would be better fitted to local conditions, and the program managers and personnel at all levels would have a greater commitment to making the strategies work. Ultimately, such a system of two-way communication should reach down to the community level, with community leaders and local organizations participating directly in the planning

and implementation of the program. Since 1977, the organization of camps for opinion leaders and the use of village panchayats for selecting village health workers have constituted important steps in this direction.

If the program is to successfully promote increased use of reversible methods, especially pills and condoms, it is important that the present logistics system be streamlined at all levels. The changes should be introduced as soon as possible, while the flow of contraceptive supplies is still relatively light, so that the program will be able to handle rapid increases in the future without serious dislocations. The streamlining of the logistics system should include more storage facilities at state, district, and PHC levels where reserve stocks can be stored to meet emergency needs, especially in the event of delays in the filling of orders at higher levels; a first-in/first-out inventory system to avoid wastage; and an efficient information system to provide rapid feedback on stocks on-hand and flowing through all levels of the pipeline, to provide sufficiently early warning of diminishing stocks. For the immediate future, there is an urgent need to increase the supply of Copper-T devices to replenish the pipeline in areas where demand for the device has outrun available supplies or threatens to do so.

The importance of reaching women is recognized by the MOHFW. Accordingly, the Ministry has urged that women rather than men be selected to serve as Village Health Guides. Nevertheless, many of the trainees are male. It is asserted that in many places it is not possible to find women well enough educated to understand the training curriculum and manual. In order to increase the proportion of women selected for training, it may be necessary to redesign the curriculum and manual to make them more understandable to semi-literate trainees. The training of dais, many of whom are illiterate, has

succeeded in increasing their understanding of family planning and their capacity to communicate their knowledge to others. It should be possible to train female VHGs in much the same manner.

Though there are substantial differences in the conditions under which the various state ministries operate, it is unlikely that they account for all the variation in state performance. It is likely that the ministries of low-performing states could benefit from increased exposure to the experience of other states. This could be accomplished through a variety of mechanisms, such as conferences, site visits, and exchanges of written materials. The exchange process should involve not only the top decision-makers but also technical specialists in such areas as communications, training, management, and research. In addition to fostering the transfer of efficient and effective approaches to program implementation, the exchange might also make officials of the high-performing states more appreciative of the special problems faced by the low-performing states and the resulting need to divert proportionately more resources to them in order to improve their performance.

The acceptability of reversible methods may be enhanced by wider provision of legal abortion, especially in the rural areas, and by explicitly pointing out that any of the reversible methods can be made 100 percent effective if used in conjunction with abortion in the event of accidental pregnancy. An important advantage of increased abortions for the Family Welfare Program -- apart from their direct effect on fertility and their health benefits -- is the potential for increased referral of abortion cases for contraception. Motivation to practice contraception is particularly high at the time of an induced abortion.

### Commercial Distribution

The Sixth Plan target includes the sale of 500 million Nirodh condoms for 1984/85 -- a little less than four times the level (130 million) achieved in 1980/81. This level represents close to the full potential of the market targeted by the Nirodh Marketing Scheme. The potential market for commercial distribution includes young couples (up to age 30 years) living in urban and semi-urban areas. There are about 110 million couples in India. About 20 percent live in urban areas and 50 percent are below the age of 30 years. This means about 11 million couples below the age of 30 years live in urban areas. In any one year, a maximum of 60 percent (6.6 million) couples are likely to use any family planning method. Even if all of them use Nirodh and use it regularly (i.e., 72 condoms per year), the total annual consumption will be 475 million condoms per year. It is obvious that a level of 500 million cannot be achieved without a substantial impact in the rural market.

Continuation of the present trajectory of inputs in terms of organization at the center, of the advertising campaign, and of marketing research do not appear to be sufficient to achieve the full potential of the marketing program. The complexities involved in the expansion of the marketing program will increase with the inclusion of a different brand of lubricated condom and oral contraceptives in the distribution network. Present organization within the Ministry of Health and Family Welfare (which includes three persons at the center) cannot adequately handle the increased complexities and workload. Consequently, the full potential of the marketing program is likely to remain unrealized. Serious consideration should be given to alternate organizational structures, including an autonomous or semi-autonomous organization with the commercial capacity required to run a very large, complex marketing operation.

## Private Sector

While India possesses a large and varied number of private sector institutions providing family planning services, their contribution to the national family planning effort is limited at present, and is stronger in urban areas and in southern states. Because of their generally high quality of services, acceptance by the community, and capacity to innovate, these service institutions can contribute substantially more to the overall national effort. An important direction for the future is to expand the efforts of these institutions through substantially increased financial support, strong encouragement at federal and state levels, and the development of mechanisms to channel support to small, private organizations. Strengthening of linkages between private and governmental services would also be desirable. PVOs can initiate new services, train government health workers, and serve as models for effective service delivery. Government can benefit by adapting successful elements of PVO programs to larger-scale operations.

The type of institutions that can be drawn into population-related work can also be expanded. For example, the Institute of Social Studies has identified over 110 agencies reaching poor women in India, many of which could provide family planning information, if not services. Other private development agencies could also be mobilized, with the intent of capitalizing on their strength in maintaining direct community involvement.

The private commercial sector is another important resource. At present, a few companies, such as Tata Industries, provide family planning services for their employees and families. A direction for the future is to encourage all industries to provide services, or at least information regarding family planning. Mechanisms to strengthen and sustain commercial efforts need

to be devised. While this sector is relatively small and urban-based, it should be relatively easy to reach, and can serve as an important focus for diffusion of family planning norms and practices in the communities. The role of the private pharmaceutical sector in manufacture, distribution and sale of contraceptives should be fully exploited in considering the expansion of the current marketing program to include oral contraceptives in its distribution network.

## RESEARCH

### Operations Research

For assessing the overall performance of the family planning program, it is necessary to conduct national-level research to augment the routine service statistics that emanate from the record-keeping and reporting system. While the service statistics provide a useful and up-to-date gauge of short-term trends in program performance, they can be misleading in the long run without supplementary survey data. For instance, the estimates of prevalence involve assumptions that need to be periodically verified or updated -- the assumption that every 72 condoms distributed provide one couple-year of protection, the assumptions about continuation rates for the IUD, and the assumptions about the degree to which fertility declines as a result of contraceptive use. Such needs can be met by conducting surveys of eligible couples at least every five years (instead of the present ten-year interval between ORG surveys) in which data are collected on fertility and its four proximate determinants -- marriage patterns, prevalence and duration of breastfeeding, use of contraception, and prevalence of induced abortion. In addition, data on contacts by field workers, access and exposure to program communications

and services, and attitudes toward and knowledge about specific contraceptive methods and program services (including MTP) should be ascertained. Surveys should also obtain information on use-effectiveness either by incorporating the necessary questions in the surveys of eligible couples or by mounting special surveys of acceptors. Either type of survey could be done at the state level, but conducting them at the national level with samples large enough to allow for statewise analysis would ensure greater comparability of responses and provide very precise estimates of national levels. The past experience with survey data on prevalence suggests a need to incorporate quality checks in the survey design to indicate the reliability and validity of survey estimates.

Given cultural, social, demographic, and other variations among states, it is probably best to conduct most other types of studies at the state level, where questionnaires can be tailored to fit local conditions and data needs. In order to develop the capacity to conduct state-level studies of high quality, it will be necessary to increase the budget for research, and to fill vacant research-related positions to free more time of state-level research personnel for participating in the design of research projects and for facilitating the utilization of research findings. It will also be necessary to upgrade the research skills of the personnel of both the state ministries and the population research centers. Presently, most research is done by salaried staff without extra funding for hiring part-time workers for interviewing, coding, or tabulations. If the state-level studies are to have sufficiently large scope to provide significant and generalizable results in a reasonably short period of time, it may be necessary to provide special additional funding for individual projects.

Such an expanded research program would require more funding than is presently available. It would also require careful planning to avoid overlooking important research needs, to ensure that research findings would be available when needed, and to facilitate the cumulative development of research-based knowledge by feeding the findings from early research into the planning and design of subsequent research projects.

Apart from periodic national surveys of the type described above, priority research areas for the 1980s include the following: surveys of program personnel, especially at the PHC level and below, to determine their work-related knowledge, work habits, sources of satisfaction and dissatisfaction with their work, and other managerially relevant topics; surveys of opinion leaders, especially those whose participation in the program has been sought, to learn of their attitudes toward past and potential future participation in the program; systematic observation of program operations, both services and communications; in-depth surveys and focus group discussions to probe attitudes toward the small family norm, program services, and contraceptive methods, and to explore family planning decision-making among eligible couples; and anthropological studies of community structure, behavior patterns, and norms in relation to program communications and services. In all these types of studies, the perspective of the users or potential users needs to be understood, if the program is to succeed in providing services that are responsive to their needs.

To make the results of research more accessible to program managers, the research planning process needs to include consideration of the problems of communicating findings to them and helping them interpret the implications of the findings for program implementation. This needs to be done at both the

central and state levels. Given the diversity -- both in terms of content and geographic area -- to be generated by the research program, there is a need for establishing a central clearinghouse with communication lines to each of the states, in which research reports can be gathered, cataloged, and abstracted, and from which inventories can be sent to state and central researchers, managers, and other population specialists. The central clearinghouse should have an information retrieval capacity and should, if possible, commission or conduct literature reviews of important topics on which information is available from diverse sources.

At the central and state ministries, there is a need for "liaison personnel" who are trained in both management and research, and who can bridge the gap between researchers and managers. Such persons could represent the program managers in designing research projects and monitoring their progress, and could represent the research organization in reporting the findings and their implications to managers. These liaison personnel could be developed from among the existing staff positions in MOHFW at the center and state-level departments, or could be hired as consultants. In addition to adding such personnel to the departments, it is essential that program managers themselves are drawn more directly into the research process from identification of research priorities to the utilization of findings, by participating more in planning, project design, and conferences. The process would be facilitated if researchers could be induced to prepare reports more clearly directed at managers -- short, simple reports that highlight management-related findings and translate these findings into recommendations for implementation.

## Biomedical Research

The family planning program does not offer a wide range of methods, and needs to add new technologies. India has led the way among developing countries in biomedical research. An important direction for the future is to build upon this valuable resource, emphasizing those aspects most directly relevant to the national program. High on the list of priorities is acceptability and safety research on existing and new contraceptives that appear to have utility for the national program, and studies on appropriate modes of introduction. As oral contraceptives are now being introduced by the MOHFW, research on their acceptability and safety is of greatest importance. Other contraceptives that could be readily introduced in the near future include the subdermal implant (Norplant) and injectable methods. An improved Copper-T IUD, the TCu 380 Ag, is also ready for use following satisfactory introductory trials. These technologies and others can be rapidly tested through the ICMR network and NIHF. Each of these methods could contribute substantially to the program within the next two or three years by increasing the options available for spacing purposes.

In view of the importance attached to laparoscopic sterilization, it is extremely important to determine the safety of this technique in India through large-scale epidemiological studies on women who have undergone this procedure. There is a lack of qualified epidemiologists in India to design and analyze large-scale studies of this type. Special training programs are required to build a cadre of epidemiologists.

At a lower level of priority, other fertility regulation methods deserve attention, including vaginal rings, new approaches to sterilization, various methods of medical termination of pregnancy, and barrier methods.

A third level of priority is research on methods that are at an early stage in the research and development process. An exception to this is the vaccine approach which has been pioneered by Indian scientists. Although much more research is required on vaccines, the role of the Indian research community is vital for their continued worldwide development.

Periodic review of research results, and examination of future priorities, need to be undertaken jointly by the MOHFW, ICMR, and NIHF. The Family Planning Foundation has coordinated such a review, and is well placed to perform this function in the future. Continued attention should be given to program relevance of technologies.

#### RELEVANCE OF BEYOND FAMILY PLANNING MEASURES

The identification and implementation of appropriate measures to raise the age at marriage, to decrease the demand for children, and to counteract the positive fertility effects of potential decreases in breastfeeding, are outside the scope of "family planning" and should be treated as "beyond family planning." Various government and private interventions can and do affect these three factors. The magnitude of their effects may be even higher than the effects of the current activities of the Family Planning Program.

A substantial expansion in the accessibility of various fertility regulation methods, no doubt, will increase their use from the current level of 23 percent, but is quite unlikely to increase it to 60 percent during the next 15 years; hence, a need for measures beyond family planning. The need would also imply that a reduction in the birth rate in India should not continue to be the sole responsibility of the Department of Family Welfare. Though this is accepted in principle in the Sixth Five Year Plan, it is yet to

be implemented. For discussion purposes, the beyond family planning measures are divided into five broad categories: (1) legal sanctions, (2) tax and welfare benefits and penalties, (3) incentives, (4) community-oriented approaches, and (5) mix of development policies.

### Legal Sanctions

This category includes legislative measures to raise the age at marriage and to limit family size (for example, compulsory sterilization). Legislation prescribing the minimum age of marriage has not been successful in raising the age of marriage. Such legislation cannot be implemented by force but might be useful in the long run to counteract the effect of social pressure to marry at a young age. Something more than legislation, however, is required to increase the social acceptability of increasing the age of marriage. The identification of possible actions requires a better understanding of forces that determine age at marriage, celibacy, and dissolution of marriage.

Legislative measures to limit family size, are politically and ethically unacceptable, and are not viable options. Such measures are neither feasible nor necessary in India because much remains to be done to implement even the non-compulsory program in an effective manner.

There are other legislative measures which might indirectly affect the balance between costs and benefits of population growth at the individual family level or at an aggregate level. Legal measures, for example, to prohibit child labor, improve the status of women, provide guaranteed employment, and provide old-age security can affect the demand and need for many children at the family level.

In general, legislative measures can be effective if they are accepted voluntarily, if they create social pressure to conform, or if they are implemented by force. Adoption of any legislative measure to restrict population growth should be carefully assessed in terms of the problems involved in its implementation, its potential effectiveness and side effects on other aspects of life, and its effect on the delicate balance between individual freedom and social responsibility.

#### Tax and Welfare Benefits and Penalties

This category includes measures involving preferential treatment for smaller families and penalties for larger families, for example, increase in taxation with family size and withdrawal of maternity benefits after the third child. Most of these measures are unlikely to have any substantial effect on fertility in India because a very small proportion of the population can potentially be affected. Moreover, linking benefits or penalties with family size would require an efficient system of verification. This would not be feasible given the incomplete registration of births and deaths.

#### Incentives

This category includes payment of incentives to individual couples for accepting contraceptive methods or for controlling their fertility. The role of incentives is a potentially important one and deserves careful study.

Incentives in India in the form of compensation for lost wages have been paid to couples for adoption of sterilization and IUDs. At least one limited experiment was conducted in which the payment of incentives was linked to the period for which the couple had no birth. In some special drives, up

to Rs. 200 in cash and kind have been paid for undergoing sterilization. High incentives in the order of Rs. 2,000 to 5,000 suggested for each sterilization may attract couples but are not viable options because of the prohibitive cost of the incentives alone and the potential for abuse. Moreover, the demographic effect would be doubtful because such a program would certainly attract a large proportion of couples who are not likely to have another birth. Three main issues requiring special attention in designing and implementing a cash incentive program are: (1) the total cost of the scheme, (2) the potential for misuse, and (3) the demographic effectiveness. If incentives beyond current levels are seriously contemplated, careful analysis and pilot studies would be required.

One way to reduce the cost and increase the demographic effectiveness of an incentive program is to identify the target group and restrict the payment of incentives to couples in this group. Of course, services without incentives must be provided to other couples as well. The age of the youngest child can serve as a useful criterion for identifying the target group -- a period of up to about three years following a birth is a good indicator that the couple has not yet become sterile. The pregnant state is one extreme of this scale -- the age of the youngest child being minus X months. Pregnant women, however, are not deemed eligible for family planning services and, therefore, are usually excluded from the target group. Still, husbands of pregnant women can be considered the prime target group for vasectomy in an incentive program. There is some evidence that women are more motivated to accept family planning methods immediately following the termination of a pregnancy. In all probability, men are also likely to be motivated while their wives are pregnant. The motivation of these husbands to undergo vasc-

tomy can be enhanced by individual incentives and "gifts" for the child to be born. Such a scheme can have substantial effect on birth rate even if it initially attracts couples with three or more living children. Pilot studies are needed to estimate the budgetary implications, to assess the acceptability of men undergoing vasectomies while the wife is pregnant, and to estimate the optimum incentives required.

### Community-Oriented Approaches

Community-oriented approaches appear to be likely mechanisms for innovations to reduce the rate of population growth by providing incentives in cash or in kind to the community, and by placing the burden of population growth on the community itself, including restricting out-migration and instituting community taxes to be paid by the entire community.

This approach has certain attractions because individuals living in a community may be more likely to identify themselves with the welfare and interests of their community, rather than of the country as a whole. Individuals may find themselves too remote from decision-makers in the central and the state governments, who may be perceived as responsible for deciding, for example, whether or not their community and in turn they themselves would have an easy access to a school or a dispensary, or to improved irrigation.

The success of community-oriented approaches is likely to depend upon the extent to which they facilitate the emergence of collective decision-making at the community level. The concept is not new in the Indian context given a long history of community development programs, but its application would require effective decentralization.

There are few examples of village-level incentives linked to a decline in birth rate or to an increase in the use of contraception in India. The effectiveness of such measures is not known and is not obvious. Other specific steps that could be taken in India are not so clear, especially in view of the fact that the Indian villages defined according to their geographic boundaries do not qualify as communities with common interests; and even if they did, about 83 percent of some 600,000 villages had a population of less than 1,000 in 1971.

The presumed success of the Chinese experience is usually given as an example of the feasibility and effectiveness of community-oriented approaches. It is doubtful that this element of the Chinese experience can be replicated in India without concomitant changes in political structure.

### Development Policies

This category includes measures to modify the mix of developmental policies to substantially enhance its effects on fertility-related attitudes and behavior. Most developmental activities do influence individual decisions about marriage, family size, spacing, and contraceptive behavior. Potential fertility effects of developmental activities could, in theory, be considered in their selection, design and implementation. However, such consideration is rare. This may in part be due to lack of interest because some programs, such as improved education, can be adequately justified solely on the basis of their primary, non-demographic objectives. In addition, how various forces affect couples' decisions about family size is not well understood. This restricts the ability to design and implement programs specifically oriented to influencing couples' decisions about family size. But much can be done.

The first step is to initiate analytical examination of alternate development policies and programs with a focus upon their anticipated or actual effects on fertility-related attitudes and behavior.

The analytical examination of policies and programs related to development of economic and human resources in India by definition will have to utilize some assumptions about how various forces in the society affect couples' decisions about family size.

The assumptions mentioned under the section on external constraints can be used in examining the policies and programs related to development of economic and human resources, with a focus upon their fertility impacts. In addition to family planning, primary focus of such an examination should be on policies and programs in three other sectors: (1) rural development including agricultural change and employment, (2) health, and (3) education. The purpose of the examination would be to see whether and to what extent investments in health and education provide opportunities for people, especially the poor, to develop their human resources; whether and to what extent rural development including agricultural change and employment reduces their dependence upon children; and whether and to what extent the family planning program provides access to services for a variety of contraceptives.

Two types of questions important for an analytical examination are: (1) whether investment in programs to create rural employment, for example, is the most cost-effective way to reduce fertility; and (2) whether and to what extent the fertility effect of investment to create employment can be enhanced, for example, through public works programs or guaranteed employment schemes. Questions of the first type require comparisons of relative fertility effects of public investments between rural development, education,

health, and family planning. These comparisons are made difficult by differences between primary objectives of sector-specific activities, and by inherent differences in the time dimension in which these fertility effects become apparent. Questions of the second type, on the other hand, require comparisons between alternate policies and programs within one sector such as education, and thus may be more meaningful and manageable. In the following paragraphs, the utility of analytical examinations is illustrated by briefly summarizing some of the results of such an examination of the education sector in India.

The education system in India has been expanding rapidly in terms of expenditure, enrollment of children in schools, and literacy rates. For example, the literacy rate in the total population increased from 16 percent prior to independence in 1941 to 36 percent in 1981. The enrollment of girls is substantially lower than that of boys, but is expanding proportionately faster than the enrollment of boys, and female literacy is increasing faster than male literacy. The education of both boys and girls, however, is still far from the national objective of universal primary education. Despite this, the share of direct expenditures on early childhood and elementary education decreased from 46 percent in 1961/62 to 43 percent in 1974/75, and it increased on higher education from 22 percent to 28 percent during the same period. The average annual expenditure per pupil by the government increases tremendously with the level of education. For example, the average cost per pupil in 1974/75 was estimated to be Rs. 83 per year in primary schools and about Rs. 3,865 per year in universities. Most of these costs are born by the government and represent indirect subsidies to students and their families.

The Sixth Plan included an outlay of about Rs. 2,524 crores for education which is about 2.6 percent of the total public sector outlay. The plan, while recognizing shortfalls in achieving the goal of universal education of all children up to the age of 14 years, allocated only 36 percent of the education resources to early childhood and elementary education, and 16 percent to secondary education. In fact, the absolute amount of funds allocated to university and higher education is more than those allocated to secondary education (Rs. 486 versus 398 crores). Out of the funds allocated to education from the central government, 39 percent is allocated to university and higher education, 23 percent to technical education, and only 7 percent to early childhood and elementary education. Obviously, the order of priorities has to be changed if the national objective of universal education is to be achieved. But, can these changes be guided by differences in the potential fertility levels of alternate allocations?

The policies of the education sector can influence the educational achievement of children and, to some extent, the balance between the cost and benefits of children's education to their parents. The latter is especially important for education beyond the secondary school level. At present, almost all of the direct cost of education is met by the government. Consequently, pressure to expand higher education has been increasing every year, and so has the budgetary allocation and expenditure. If the actual cost of higher education is distributed among students and their parents, it would reduce pressure for a continuous expansion of higher education and, by increasing the actual cost of higher education to be borne by parents, might have a negative feedback effect on fertility of parents and their peer groups. Certain measures, in terms of loans and scholarships for bright students from poor families,

would have to be taken so that they also have opportunities for better education.

Improvements in children's education will affect their own subsequent fertility because female education has been consistently shown to be inversely related to fertility. Even primary school education can have negative effect on fertility by enhancing the chances of their exposure to mass media. Thus, the policies and programs of the education sector can influence the average fertility of the cohort of female children who become eligible to enter the school system in 1981 by increasing the proportion of children who complete primary level education. Efforts have to be made to identify and implement programs oriented to decreasing the high drop-out and repetition rates during the initial years of schooling.

An emphasis on primary education will require allocation of additional resources for primary school education, which can be done by increasing the total resources allocated to education or by reallocation of resources within the education sector. Changes in order of priorities including allocation of resources to reflect an emphasis on broad-based primary level education, along with a substantial recovery of cost of higher education from students and their parents, would likely have a negative influence on the future course of fertility in India.

In sum, there is enough potential to improve the accessibility of appropriate fertility regulation methods, which will facilitate and increase the use of contraception, sterilization, and induced abortions, and will contribute to fertility decline. However, if past experience is any guide, improvements in the family planning program alone are unlikely to reduce the

birth rate to the extent desired and projected; hence, the need for identification and implementation of measures beyond family planning.

The discussion presented above clearly demonstrates a need for expanding policy-relevant research to identify and evaluate "beyond family planning" measures. This is not instead of but in addition to research related to family planning. This has budgetary implications. Almost all the resources for social science research in population in India are allocated from the family planning budget, which may have contributed to an overemphasis on research related to family planning. An expansion of policy-relevant research beyond family planning would require a diversification of resources.

A distinction between family planning and beyond family planning measures has organizational implications as well. As mentioned earlier, one option is to define the responsibilities of the program in terms of increasing the availability of information on and services for a variety of fertility regulation methods, and to shift the overall responsibility for achieving national demographic objectives to the Planning Commission. This would make sense because identification and implementation of beyond family planning measures require an examination of the first and the second order effects of policies and programs in various sectors.

## VIII. OPPORTUNITIES FOR US ASSISTANCE

Following an absence of US assistance to the Indian population program from 1973 to 1979, a renewed bilateral aid program was established, and the number of centrally-funded AID activities increased. At the present time, the climate for continued US assistance is particularly good and, indeed, there is evident desire for increased support in the future. The technical capacity of USAID and other US institutions in the population field is recognized in India. The renewed commitment of the government to population efforts suggests that this is an especially propitious time for US assistance to be maintained and expanded in areas of mutual interest, where the US can offer particularly relevant support.

At the same time, it must be emphasized that approximately 82 percent of the government's family planning budget is financed by the government itself, and that an increased domestic contribution to the program is essential for success. International assistance, while marginal to the overall resources required, can make a substantial difference in improving and expanding the national program effort. The following areas are seen to be highly significant for achieving the national objectives and the expansion of the program, consistent with the government's policies and priorities, and corresponding to the technical strengths and experience of USAID and supporting US-based institutions.

1. USAID should seek opportunities to facilitate broad-based, population policy-oriented work leading to improvements in policy formulation, program planning, implementation, and evaluation.

The importance of broad-based, policy-oriented work cannot be over-emphasized. The Sixth Five Year Plan recognizes the importance of reducing the rate of population growth, and recognizes the role of many factors, such as young age at marriage, low levels of female literacy and education, high infant and child mortality, low status of women, and high poverty levels, in maintaining high fertility. The Plan calls for improvement in each of these factors. However, there are no focused policies, programs, or increases in resources to achieve this improvement. While the Plan document emphasizes that the responsibility for reducing the rate of population growth has to be shared by various ministries, there is no mechanism that will help the government to move from intention to implementation.

While the national demographic objectives set by the national government are known, there is no overall, coordinated strategy to achieve these objectives, combining plans to improve the underlying factors determining high fertility with plans to satisfy the demand for smaller families through the family planning program. Such a strategy has to involve a number of sectors, especially education, agriculture, social affairs and rural reconstruction, as well as health and family welfare. The issues go beyond the provision of contraceptive services through the field infrastructure of other ministries. They involve planning and resource allocation for development of human resources through improving primary education and decreasing infant and child mortality; understanding the implications of agricultural and rural development for sociocultural change, including the economic role of women and children; and understanding the implications of the minimum needs program and Guaranteed Employment Schemes with regard to demographic behavior. The Sixth

Plan document has recognized some of the linkages, but they have yet to be put to practice in sectoral planning.

A mechanism, obviously outside the Department of Family Welfare, is required to facilitate and coordinate systematic work leading to the identification, implementation, and evaluation of various interventions to reduce the rate of population growth. The Planning Commission appears to be the logical place for developing and establishing such a coordinating mechanism, but other avenues, including the office of the Registrar General, should also be explored.

Indian organizations and social scientists have to take the lead in establishing priorities and undertaking broad-based, policy-oriented research and analysis of population and development issues. What the future role of USAID in this work might be is not clear because of its sensitivity, and because it will not involve a significant transfer of resources. Nevertheless, USAID can play an important role by highlighting the importance of this work. This can be done through discussions with the Planning Commission and other institutions to assess their perceptions and needs, and to crystalize the issues involved. A second step would require identification and establishment of appropriate mechanisms under which policy-oriented research and analysis can be undertaken and utilized. If appropriate, USAID, with the concurrence of the government, might invite a team of experienced social scientists to further explore these issues with Indian planners and social scientists, and to assist them in establishing appropriate mechanisms. These mechanisms might include commissioned research on selected topics; the establishment of a network of Indian institutions; and participation of selected

US-based institutions through research collaboration, seminars and workshops, and an exchange visitors program.

2. USAID should seek opportunities to strengthen program planning practices at the national and state levels.

A major constraint in the implementation of the National Family Welfare Program is the inadequate planning of program inputs at all levels, including the need for resources, management systems, trained manpower, supply and distribution systems, and relevant research. USAID, with its present involvement in five states, has an excellent opportunity to work closely with state Ministries of Health to introduce or strengthen planning concepts and practices. Future support to low-performance states should emphasize management and planning needs. Similar opportunities should be explored at the Central Ministry of Health and Family Welfare, especially in conjunction with the preparations for the next Five Year Plan. Detailed plans will be required to obtain the large budgetary increases needed for the achievement of the government's demographic objectives, and to implement the program effectively. There are highly competent individuals and management groups in India that could assist in this planning process. USAID should explore the possibility of assisting the government in utilizing available management and planning skills.

3. USAID should support efforts to effectively incorporate reversible contraceptive methods into the program.

Achievement of national objectives in contraceptive prevalence will require a dramatic increase in the use of oral contraceptives, IUDs, condoms,

and perhaps other reversible methods. This requires a major shift in emphasis away from sterilization, and will necessitate expanded manufacturing capabilities, strengthened logistics and distribution systems, training of personnel, and special efforts to overcome opposition to the use of orals and IUDs. USAID has a unique capability to assist in all aspects of this effort, from product introduction planning to delivery at rural levels. India has manufacturing capability for orals, IUDs and condoms, but production needs to be greatly expanded, and quality control procedures strengthened. Both USAID and US private sector resources can be important contributors to this essential activity.

The need to design and implement new logistics systems at the national and state levels is another crucial area appropriate for USAID support. A calculated, carefully planned product introduction program will require product information materials, scientific and educational programs for physicians and other health personnel, and a massive training effort for service delivery personnel and their supervisors. Successful product introduction will require coordination of all these elements, at national and state levels. USAID's new project under discussion should provide an opportunity to assist the centrally-planned elements of this effort. The five-state rural assistance program will enable USAID to help in the implementation of the service delivery aspects, test appropriate training and supervision programs, and measure effectiveness. USAID assistance to research activities to test the safety and acceptability of reversible methods will assist in program planning, and should serve as an important source of information to counteract professional resistance.

4. USAID should support efforts to expand the Social Marketing Program.

Plans to dramatically expand the role of subsidized commercial distribution of condoms, and to add orals as well, require a much larger, reorganized management and marketing system. USAID, with its extensive experience in this area, is ideally suited to provide technical assistance. This is the most important element in the new assistance program under discussion, and deserves highest priority. Careful consideration should be given to the establishment of an autonomous or semi-autonomous management structure, separate from the MOHFW. This would enable the program to operate on a commercial basis, facilitate the recruitment of sufficient numbers of qualified market specialists, and permit greater flexibility. In any case, a substantial increase in qualified marketing staff will be required. USAID can assist in planning, market research, promotional campaigns, distribution, logistics, and evaluation.

5. USAID should support program-related research, especially operations research and evaluation for management needs, and safety and acceptability of contraceptives.

In view of the dramatic increase in program effort that is envisaged, and the diversity that exists among Indian states, extensive and continuous experimentation will be required to achieve the most effective program operations at local and state levels. Operations research and management feedback are essential for this process. USAID and US-based organizations have expertise and experience in operations research to contribute to effective program implementation. USAID participation in the area support program in five states gives an excellent opportunity to incorporate operations research in

the design and implementation of these rural programs. Such research should start as soon as possible if it is to influence the implementation of the USAID assisted projects. Indian operations research capabilities are strong. USAID's role should be to bring together US-based and Indian operations research agencies to assist state and district level programs. Special efforts will be needed to assure that research is relevant to program needs, that results are quickly obtained and published, and that the information is fed back and utilized by program managers. USAID can also facilitate the wider dissemination of research results through exchange visits among state officials, publications, and workshops. To facilitate these activities, technical assistance through the USAID Mission or through US intermediary organizations will be required.

Another area requiring attention is monitoring of changes in fertility and its proximate determinants through periodic national surveys at intervals of five years. Indian organizations have the technical capacities to conduct this type of survey. For example, the Operations Research Group conducted two surveys in 1970 and 1980. USAID, perhaps, can facilitate the establishment of a mechanism through which this type of survey can be repeated every five years.

Research on the safety and acceptability of existing and new contraceptives is important to support the introduction of a number of reversible contraceptives, including oral contraceptives, IUDs, injectable methods, and the Norplant sub-dermal implants. Strong research capacity exists in India, and USAID should support program relevant research and facilitate the use of research results for program purposes. There are very few skilled epidemiologists in India to plan and analyze large-scale safety and acceptability

studies. Fellowships in epidemiology for a number of qualified Indians are recommended.

Support to research and development of new contraceptives should receive lower priority, largely because this work in India is adequately supported by the National Institutes of Health, World Health Organization, Ford and Rockefeller Foundations, International Committee for Contraceptive Research, Program for Applied Research on Fertility Regulation, International Fertility Research Program, International Development Research Centre, Family Planning Foundation and the Indian government. USAID should help in facilitating these collaborative efforts.

6. USAID should continue overall support to state-level programs and should consider future extension to low-performance states.

As indicated in the previous recommendations, USAID participation in five state-level rural family planning and health programs provides an important opportunity to assist the government in local-level implementation, which will be the ultimate test of the program as it expands beyond intermittent sterilization camps to a comprehensive program. Such assistance, including planning and management, operations research, staffing, training, supervision and evaluation, has been well received and is potentially useful beyond the boundaries of the existing areas. The five states initially selected are moderately successful in past family planning performance. The greatest challenge for the future lies in the populous low-performance states, especially Uttar Pradesh and Bihar. While no change in USAID involvement with state-level programs is presently recommended, USAID should in the future consider

extending its assistance to state-level programs in some of these low-performing regions.

7. USAID should continue to support private voluntary organizations.

India has many PVOs, including several that have developed highly successful, flexible, and innovative family planning programs, usually with strong community linkages and effective integration with other development activities. USAID, through its new rupee grant for PVOs, is well positioned to channel support to large PVOs, including associations of health practitioners (private physicians, Ayurvedics, and Unanis). This program should continue to receive support, including publication of success stories and utilization of relevant experiences for government planning purposes. In addition, appropriate mechanisms within India to assist smaller PVOs need to be developed, both at national and state levels. There is a large potential for growth of the private sector, and an even larger potential for stimulating and improving to public sector programs. While some assistance for Indian PVOs may come from centrally-funded programs such as FPIA, direct support through an India-based and managed mechanism is preferable.

8. USAID should support selected information, education, and communications programs, emphasizing information on methods.

Over the past two decades, India has invested heavily in motivational IE&C activities, promoting a "two child" norm and the general importance of family planning. Its impact has not been demonstrated. What is required at this stage is a greatly expanded effort to provide users and potential users with practical information on each contraceptive method: how it is used,

where it can be obtained, and what its advantages and disadvantages are. These materials need to be prepared and printed in sufficient quantities for illiterate or semi-literate populations, with use of pictures and symbols. This approach is an essential component to the effective introduction of reversible contraceptives and is crucial to their wide acceptance and continued use. Support to further motivational and awareness-raising efforts in IE&C should be given a much lower priority.

\* \* \*

#### POSSIBLE US PRIVATE SECTOR COLLABORATION

The team was requested to investigate the potential role of the US private sector in support of the Indian population program, and to suggest ways that it could be enhanced.

Many of the above-mentioned program areas have been supported by private US groups. This includes the Ford and Rockefeller Foundations, and the Population Council in the biomedical field; several US PVOs in program delivery; as well as a significant number of US-based private organizations receiving centrally-funded USAID support. Most of these activities appear to be serving useful purposes, and should be encouraged by USAID. In fact, USAID may need to increase the role of centrally-funded agencies in India to support and implement a number of the activities recommended in this report.

An additional area of involvement is in the manufacture and marketing of contraceptives. US industrial input may be required to expand and improve manufacturing capacity and to ensure high levels of quality assurance. US marketing skills may best be provided by private US agencies. These potential

roles for private sector groups need to be explored as USAID develops its new grant program in contraceptive manufacture and commercial marketing.

The government intends to encourage increased involvement of the Indian industrial sector in family planning, particularly through the provision of family planning services to employees. Beyond this, it is desirable to stimulate greater awareness and concern about population problems among leading industrialists in order to stimulate policy debate in the areas of government development policy as it affects population, roles of foreign aid to the private sector, and similar topics. This can be accomplished by encouraging exchanges between Indian and US business groups, organizing symposia, and preparing policy briefs that present population issues in terms relevant to business concerns. The Population Resource Center in the US undertakes similar programs to stimulate awareness among American business leaders, and could probably facilitate exchanges between the Indian and US business communities. Business International Inc., is another private US agency that studies relevant business issues globally, and arranges conferences and exchanges. In India, the Employers' Association has expressed interest in such a program, and is willing to enter into discussions with the US business community.

## APPENDIX

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