Fertility Transition in India: 1985-2003

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Abstract

Using the data available through the Sample Registration System, the present paper employs a decomposition methodology to analyse the transition in fertility in India and in 15 of major states for the period 1985 through 2003. The analysis reveals that while the population fertility, measured in terms of the crude birth rate, declined monotonically in the country and in all states throughout the period 1985-2003, the decrease in individual fertility, measured in terms of the annual average marital fertility rate was stalled in the country and in most of the states in the post 1995-97 period when the target free approach or the community needs assessment approach was introduced for the implementation of the National Family Welfare Programme. It has been observed that while the prevalence of contraception, the most important determinant of fertility within the institution of marriage, increased under the target free regime, nearly all the increase was confined to an increase in the prevalence of modern spacing and traditional methods of contraception. However, because of the poor efficiency and effectiveness of the modern spacing and traditional methods of contraception, increase in the contraceptive prevalence rate appears to have little impact on the fertility of married women.

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1. Introduction

Fertility in India continues to remain well above the replacement level although it is decreasing. There are many countries in the world, notably Bangladesh and China, where fertility has reduced at a faster rate than in India despite the fact that India was the first country in the world to adopt an official policy towards population stabilization and launch the official National Family Planning Programme, now known as National Family Welfare Programme, which was directed specifically to fertility reduction through birth limitation as far back as 1952. It is difficult to say up to what extent the official efforts to reduce fertility and control population growth have succeeded. Typically, government highlights the achievements and successes of these efforts, while the critics point to its numerous shortcomings, failings and missed opportunities. In any case, it is obvious from the available evidence that the current levels of fertility in the country and in many of its constituent states are not acceptable either in terms of the demographic rationale or through the development perspective. Although, fertility is decreasing throughout the country, yet, the importance of an acceleration in fertility reduction efforts cannot be understated, especially in those states where the fertility transition remains slow.

Concern about high fertility and its impact on the well-being of the people in India is not new. Way back in 1944, Jawaharlal Nehru, the first prime minister of India raised concerns about the high birth rate in India in his famous Discovery of India (Nehru, 1946). Nehru argued that the eastward sweep of modern medical technology would lead to a significant reduction in the death rate and hence a substantial increase in population in the absence of a decline in the birth rate. He was of the view that India would be better off with fewer people rather than a larger population. Nehru's views on population growth and high birth rate constituted the basis for strong, state-supported, fertility reduction and population stabilization efforts in the independent India. Population control and fertility reduction through family planning has since been one among the priority issues in the social and economic development agenda, even though a consistent approach towards fertility reduction has often been found lacking. There had been a tendency among the policy makers and programme administrators to search for ideal solutions in the framework of a very short time duration. This tendency resulted in the practice of polarization - drifting from one solution to another at very short intervals, primarily based on conjectures and little empirical evidence - but none offered a complete or near complete solution (Ranjan, 1999). The rush towards achieving the pre-stated demographic goals without giving any consideration to the felt family welfare needs of the people and the complex social, religious, cultural and family dimensions of reproductive behaviour often resulted in the application of coercion and force in the implementation of the National Family Welfare Programme. Population stabilization, especially, family planning, became a politically sensitive issue leading even to the defeat of the popular government. The National Population Policy 2000 has called for achieving replacement fertility by the year 2010 (Government of India, 2000). The available evidence, however, suggests that this goal is difficult to achieve.

The importance given to population stabilization and fertility reduction efforts in India's social and economic development agenda is also evident from the fact that family planning as a subject has been included in the concurrent list of the Constitution of India and the National Family Welfare Programme, the mainstay of fertility reduction efforts in the country, is funded almost entirely by the central government. The states are, however, free to design and implement their own fertility reduction efforts within the umbrella of the National Population Policy. The National Family Welfare Programme has traditionally been focussed on regulating fertility of individual woman through the universalization of the use of family planning methods to achieve the small family norm. Particular emphasis in programme implementation has been on the promotion of terminal methods of family planning - female and male sterilization. In recent years, the scope of the Programme has been broadened to cover issues related to reproductive and child health in view of the fact that a birth may also be viewed as a response to death, especially the premature death - death of infants and young children. As such, it is argued, that reduction in mortality, particularly in infant and child mortality, is a necessary precondition for reducing fertility and, therefore, is a priority under the National Family Welfare Programme.

In the above context, we analyse fertility transition in India and in states with a population of at least 20 million at the 2001 population census. The purpose of the analysis is two fold. First an attempt has been made to characterize the trends and differentials in the levels of fertility in the country over time and across different states. Second, we attempt to link the observed trends and differentials in fertility with the population stabilization and fertility reduction efforts that have remained on the priority list in the development agenda of the country. The analysis, thus provides an objective assessment of the impact and efficacy of the official population stabilization efforts in the form of the National Family Welfare Programme to reduce fertility and control population growth.

The paper is divided into six sections in addition to this introduction and the customary conclusion. The next section of the paper develops the methodology for analysing transition in fertility. Section 3 describes the data source used in the analysis and discusses its quality and limitations While section 4 discusses the current levels of fertility in India and highlights inter-state and rural-urban disparities. Section 5 of the paper analyses trends in population fertility and the fertility of an individual woman whereas, in Section 6, we apply the decomposition methodology developed in Section 2 to explore transition in population fertility separately for combined, rural, and urban populations. Section 7 of the paper discusses, at length, the possible reasons responsible for the observed transition in fertility, especially in the context of the performance of the National Family Welfare Programme. In conclusion, the paper highlights some of the inherent problems and inconsistencies associated with the existing population stabilization efforts and calls for reinvigorating these efforts through building up the planning, monitoring and evaluation capacity at the local level.

2. Methodology

According to the United Nations, 'fertility' refers to actual birth performance - production of a live birth or a child born alive - as compared with 'fecundity' which refers to the biological or physiological capacity to 'reproduce' (Pressat, 1985; United Nations, 1958). The birth performance can be measured at the level of an individual woman in the reproductive age group as well as at the level of the population. Since, the birth performance of a woman is age dependent and since women constitute only a proportion of the total population, the birth performance at the population level, is determined by the average birth performance of the individual women, by the age structure of women in the reproductive age group and the size of reproductive age women measured through the ratio of women in the reproductive age group to the total population.

As regards the birth performance of an individual woman, a number of proximate determinants have been identified (Davis and Blake, 1956; Bongaarts, 1978). Most prominent of these proximate determinants are age of the woman at the time of entry into marital union; practice of contraceptive methods either to postpone or prevent pregnancy and associated birth; aborting a conception that has already taken place and the fertility inhibiting effects of breastfeeding. These proximate determinants of average birth performance of individual women are, in turn, influenced by a host of social, economic, cultural and family factors that may vary from woman to woman. As such, any objective assessment of transition in fertility requires an analysis of the trends in the average birth performance of individual women as well as the analysis of transition in birth performance at the level of the population. This requires that transition in birth performance at the level of population is first decomposed into transition in the average birth performance of individual women, transition in the age structure of women in the reproductive age group and transition in the patterns of marriage. Then, this may be followed by analysing how transition in the different components of birth performance at the population level influences the overall transition in the birth performance at the population level. Most of the analyses of fertility transition in India, however, have focussed on the transition in average birth performance of individual women only which is measured in terms of the total fertility rate. There has been little attempt to analyse how, at a given level of the birth performance of individual women, the age structure of the women and patterns of marriage have influenced fertility at the level of the population. An analysis of the impact of age structure changes on fertility at the level of the population is now becoming more and more important as fertility and mortality levels are declining leading to transition in the age structure of the population. It has been projected that most of the future population growth in the developing countries will be the result of the momentum generated by age structure transition rather than high fertility and high mortality (Bongaarts, 1994).

As discussed earlier, the influence of age and sex structure and patterns of marriage on birth performance at the population level can be explained in terms of three factors :- proportion of women in the reproductive age group to the total population, proportion of married females to total females in the reproductive age

group, and the age distribution of married females in the reproductive age group. Since women of all ages are not exposed to the risk of pregnancy, the first factor that influences population fertility at a given level of individual fertility is the size of the female population in the reproductive age group.

The second factor that influences birth performance at the population level but not at the individual level is related to marriage. In many societies, including India, marriage signals the beginning of socially recognized sexually active reproductive life. As such, the exposure to child bearing is linked with the time of entry into the marital union and disruption of marital union through divorce, separation and mortality. All these factors are accounted by the proportion of females married in the reproductive age group.

Finally, birth performance at the level of population is also influenced by the age structure of married females in the reproductive age group as the biological or physiological capacity to reproduce varies with age. Two populations having the same proportion of married females in the reproductive age group may have different levels of birth performance at population level even if the birth performance at the individual level is the same just because the age distribution of married females in the reproductive age group in the two populations is not the same.

The most commonly used indicator for measuring the birth performance of a married woman in the reproductive age group is the total marital fertility rate (*TMFR*). Conventionally, *TMFR* is defined as the total number of children, likely to be born to a married woman during her entire reproductive life if she experiences the currently prevailing age-specific marital fertility rates. In fact, the total marital fertility rate may also be interpreted as the unweighted sum of the average number of children born to married women of different ages of the reproductive age group in a year or the unweighted sum of the birth performance of a group of women belonging to different cohorts in a given year. If g_i is the average number of children born to currently married women of age i, then by definition

$$TMFR = \sum_i g_i = \sum_i b_i/w_i \,,\ i = 15, \ldots\ldots 49 \qquad (1)$$

where w_i is the number of married women of age i and b_i is the number of births to these married women in a year. Thus the unweighted average birth performance of a married women in the reproductive age group (*AMFR*), may be defined as

$$AMFR = g = \sum_i g_i/35,\ i = 15, \ldots\ldots 49 \qquad (2)$$

$$= TMFR/35. \qquad (3)$$

On the other hand, the most commonly used measures of birth performance at the population level is the crude birth rate (*CBR*). The crude birth rate, in conjunction with the size of the population determines the annual number of births which, in turn, decides the rate of natural increase in the population along with the crude death rate.

It is now possible to represent the crude birth rate (*CBR*) - a measure of birth performance at the level of the population as

$$CBR = (CBR/GFR) \times (GFR/GMFR) \times (GMFR/AMFR) \times AMFR \qquad (4)$$

where

GMFR = General marital fertility rate, and

GFR = General fertility rate

By definition, the ratio *CBR*/*GFR* is the proportion, *p*, of females in the reproductive age group to the total population. Similarly, the ratio *GFR*/*GMFR* is the proportion, *m*, of married females to the total females in the reproductive age group. Finally, following Hourichi (1995), it can be shown that the ratio *AMFR*/*GMFR* is a measure of the age distribution, *a*, of the married females in the reproductive age group. In fact,

$$GMFR = \sum_i w_i g_i / \sum_i w_i. \quad (5)$$

In the special case when $w_i = 1$ for all i, we get

$$AMFR = \sum_i g_i / \sum_i 1 = \sum_i g_i /35. \quad (6)$$

The multiplicative identity (4) provides a useful approach for analysing the transition in the birth performance at the population level in terms of the transition in the birth performance at the individual level and transition in (a) age distribution of married females in the reproductive age group, (b) proportion of married females to total females in the reproductive age group, and (c) proportion of females in the reproductive age group to the total population. In other words,

$$b_2/b_1 = (p_2/p_1)*(m_2/m_1)*(a_2/a_1)*(g_2/g_1) \quad (7)$$

or

$$r_b = r_g + r_a + r_m + r_p \quad (8)$$

where $r_b = ln(b_2/b_1)$, etc.

Of the four factors on the right side of the identity (8), age distribution of married women in the reproductive age group and proportion of reproductive age females in the population are influenced by the time of the beginning of the fertility transition. In populations where fertility transition has not yet started or where transition is at an early stage and where mortality remains high, most of the population is concentrated in the younger ages with the result that the proportion of population, either male or female, in adult ages remains low. On the other hand, in populations where fertility transition started 15-20 years ago or even earlier and where mortality has also decreased substantially, most of the population is concentrated in the adult ages group. With the progression of fertility transition, the age distribution of married females in the reproductive age group also undergoes significant changes. In populations where fertility remains high, a large cohort of females enter the reproductive age group every year leading to an age distribution which is skewed to high fertility age groups. On the other hand, in a population where fertility has decreased substantially, a progressively smaller cohort of females enter the reproductive period every year with the result that the age distribution of females in the reproductive age group gets gradually skewed to low fertility ages. The transition in the proportion of married females to total females in the reproductive age group primarily as a result of the increase in the female age at marriage, also accelerates this process of the at in the age distribution of married females in the reproductive age group. Transition in the age structure does not reflect short-term changes in fertility and mortality. They can be considered as medium term trends

resulting from the changes in fertility and mortality around 15-20 years ago. Average fertility of married women in the reproductive age group and female age and marriage, on the other hand, can be modified, even in a short duration, through such programme interventions as family planning and female education. In this context, transition in the average fertility of married women in the reproductive age group may be viewed as a reflection of the performance of the National Family Welfare Programme, especially the family planning component of the Programme which is directed, specifically, to regulatione fertility through either birth spacing or birth limitation.

3. Data Source

The analysis presented here is based on annual estimates of the different indicators of fertility available through the Sample Registration System. The Sample Registration System tracks births through continuous enumeration by resident enumerators, as well as through biannual surveys. The continuous enumeration and biannual survey results are matched to minimize the errors of duplication and omission. Unmatched and partially matched events are referred to the field again for verification. Introduced as a pilot scheme in some select states in 1964-5, the Sample Registration System was extended to cover the whole country in 1969-70. In recent years, the size of the sample covered under the System has been enlarged considerably. Moreover, in order to maintain the representative character of the sample and improve efficiency, the sampling units are periodically replaced. It had been a practice to stagger the replacement of the sampling units over a period of 2-3 years. However, the latest replacement has been carried out in one go. Effective from 2004, this sample is based on the 2001 census frame. At present, the system is operational in 7597 sample units - 4433 rural and 3164 - spread across all states and Union territories of the country and covers about 1.3 million households and 6.73 million population (Government of India, 2006).

Estimates available through the system are generally believed to be quite accurate. There have been some attempts to evaluate the completeness of vital events reported in the sample registration system by matching the events recorded in an intensive enquiry with those recorded in the regular phase. One such investigation conducted in 1980-81 suggested an omission rate of 3.1 per cent for births at the all-India level (Government of India, 1983). Another enquiry conducted in 1985 suggested that omission rate had declined to 1.8 per cent for births (Government of India, 1988). Among different states of the country, the omission rate has been found to be highest in Assam (3.7 per cent) followed by West Bengal (3.0 per cent), Uttar Pradesh (2.8 per cent) and Karnataka (2.3 per cent) in the year 1985. Recently, Mari Bhat has estimated that the Sample Registration System has missed about 7 per cent of the births using the generalized growth balance technique (Mari Bhat, 2002). Mari Bhat has also concluded that there has been no substantial change in the completeness of the reporting of births covered under the Sample Registration System, although some improvements in the accuracy of data available through the System appears to have taken place in some states of the country. These

improvements may have resulted in a slightly underestimated pace of fertility decline. However, this is not likely to have a major impact on the estimation of the medium-term trend.

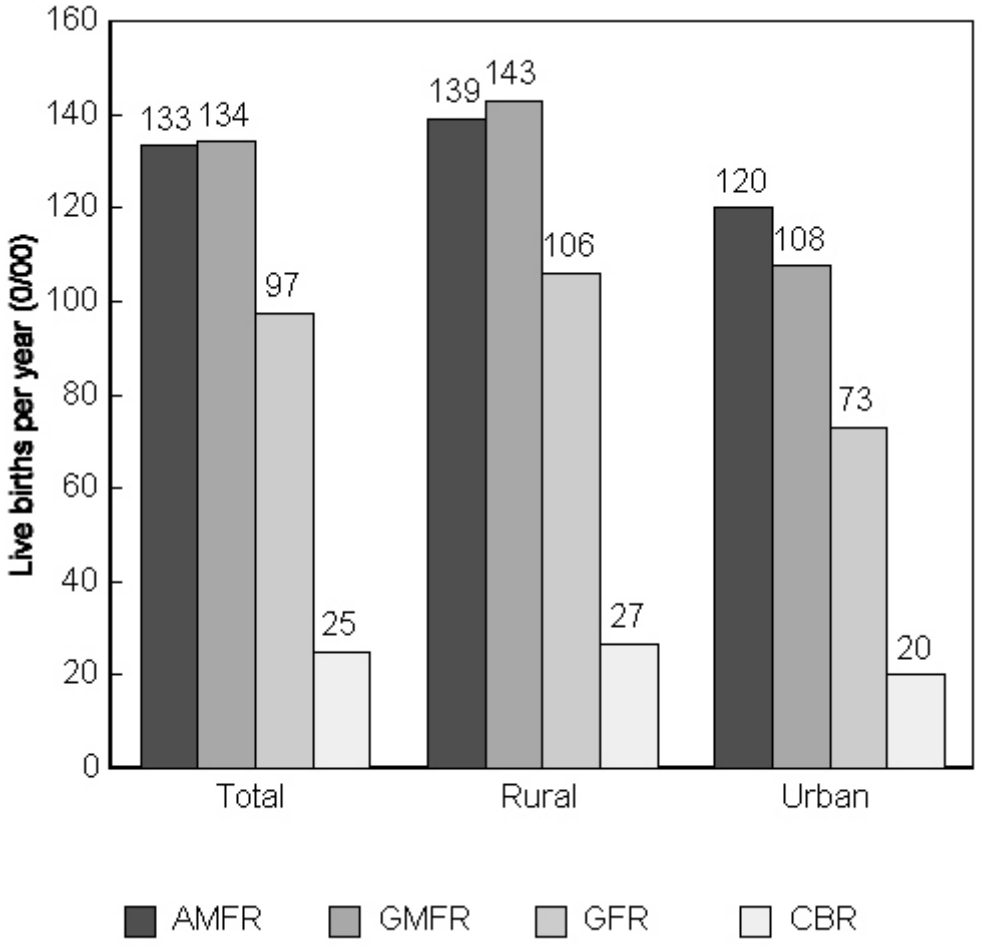
Estimates of various demographic indicators available through the Sample Registration System are known to be associated with year-to-year fluctuations due primarily to non-sampling errors of unknown origin. Any analysis of trends based on the estimates available through the Sample Registration System, therefore, first requires elimination of these errors. It is customary to use three-year moving averages instead of annual estimates to minimize these errors. This practice has been followed in the present analysis also.

Besides the Sample Registration System, estimates of different indicators of fertility are available from a number of other sources such as the population census, National Family Health Survey, district-level household survey. Estimates of fertility for the country as a whole and for its different constituent states available through these surveys are not suited for the analysis of fertility transition as these surveys provide information at a particular point of time only. Moreover, the methodology used in these surveys is not the same which may have some impact on the comparability of the estimates over time. The analysis, therefore, is restricted to the information available through the Sample Registration System only.

4. Fertility in India

Estimates of different indicators of fertility (birth performance) available through the Sample Registration System suggest that, for India as a whole, birth performance at the level of population, measured in terms of *CBR* was around 25.1 live births per year per 1000 population during the period 2001-03 while the birth performance at the level of married women in the reproductive age group, measured in terms of *AMFR* was around 133.3 live births per year per 1000 married women in the reproductive age group. This *AMFR* is equivalent to a *TMFR* of 4.667 live births per married woman of reproductive age which can be rated as high by all standards. On the other hand, the general marital fertility rate *GMFR* was estimated to be 134.2 live births per year per 1000 married females in the reproductive age group. The fact that the *GMFR* was higher than *AMFR* implies that, during the period 2001-03, the age distribution of the married females in the reproductive age group in India was skewed towards high fertility ages, albeit marginally. Similarly, *GFR* was around 97.3 live births per year per 1000 females in the reproductive age group which suggests that about 72.5 per cent of the females in the reproductive age group in India were in the marital union during the period 2001-03. Finally, a big drop in the birth performance from a *GFR* of 97.3 live births per year per 1000 females in the reproductive age group to a *CBR* of about 25.1 live births per year per 1000 population indicates that females in the reproductive age group constituted around 25.8 per cent of the total population of the country during the period 2001-03. The role of the age structure of females in the reproductive age group and the patterns of marriage in deciding birth performance at the level of the population is obvious.

Figure 1: Fertility levels in India: 2001-03



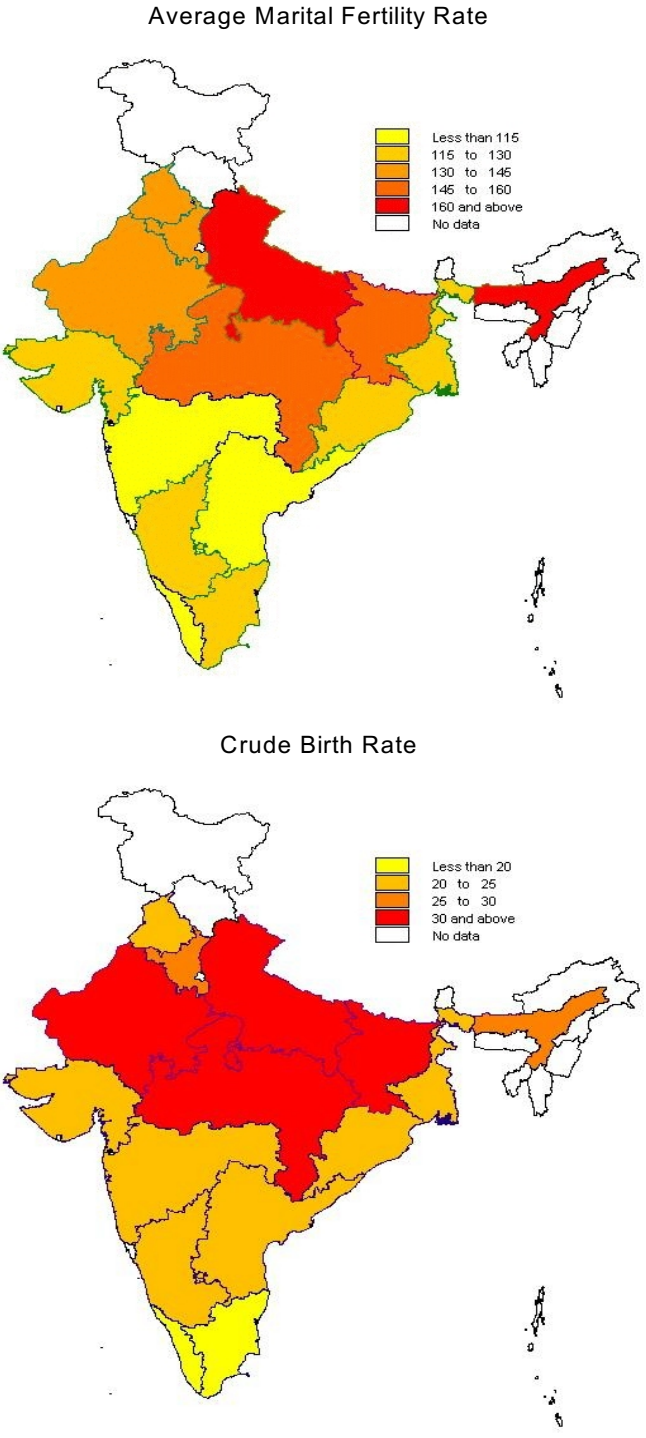
A similar pattern prevailed in rural India also. The age distribution of married females in rural India induced an increase while the proportion of married females to total females in the reproductive age group and the proportion of females in the reproductive age group to the total population induced a decrease in the level of population fertility at a given level of individual fertility. In urban India, on the other hand, the age distribution of married females in the reproductive age group did not induce an increase in fertility as the *GMFR* was less than the *AMFR*. This indicates that the age distribution of urban married females in the reproductive age group was not skewed towards high fertility ages.

The rural-urban gap in different indicators of fertility is also not the same which highlights the difference in the age structure of females and female marriage patterns in rural and urban areas. In rural India, the *GFR* was nearly 1.45 times higher than the *GFR* in urban India whereas the rural *CBR* was 1.33 times higher than the urban *CBR* during the period 2001-03. However, the rural-urban gap in the

individual fertility was not very large as the *AMFR* in rural India was around 1.16 times higher than the *AMFR* in urban India. This shows that the rural-urban difference in the age distribution of married females in the reproductive age group and the rural-urban difference in female marriage patterns also contribute to the rural-urban difference in population fertility. In fact, the rural-urban differences in the age structure of married females and rural-urban differences in the female age patterns of marriage - especially proportion of females married in the reproductive age group - actually, increased the rural-urban disparity in fertility at the population level at the given level of fertility at the individual level.

Among different states of the country, both population fertility and individual fertility vary widely. All indicators of fertility are highest in Uttar Pradesh and lowest in Kerala as of 2001-2003 but the ranking of other states in terms of both individual fertility and population fertility has changed over time. We have ranked the states from the lowest to the highest in terms of individual fertility as well as in terms of population fertility. This exercise reveals that rank in individual fertility has been better than the rank in population fertility in Andhra Pradesh, Bihar, Gujarat, Haryana and Rajasthan. On the other hand, in Assam, Punjab and Tamil Nadu, rank in population fertility better than the rank in individual fertility while in Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Uttar Pradesh and West Bengal, the two ranks have remained the same during the period 2001-03. A relatively lower rank in population fertility as compared to the individual fertility in a state implies that transition from individual fertility to population fertility is relatively slower in the state as compared to the states where the rank in population fertility is higher than the rank in individual fertility. In these states, the age structure of the population as well as the patterns of marriage decelerates the process of transition from individual to population fertility. On the other hand, a relatively higher rank in population fertility as compared to individual fertility implies that the age structure of the population and marriage patterns tend to accelerate the process of transition from the individual fertility to population fertility. Obviously, the transition from individual fertility to population fertility varies from state to state depending upon the transition in the age distribution of married females in the reproductive age group, transition in the proportion of married females to total females in the reproductive age group and transition in the proportion of females in the reproductive age group to the total population. In Andhra Pradesh, Assam, Karnataka, Kerala, Maharashtra, Orissa, Punjab, Tamil Nadu and West Bengal, the ratio *GMFR*/*AMFR* is less than 1 which implies that the age distribution of married females in the reproductive age group is skewed towards low fertility ages that means that the age structure of married females lowers population fertility at a given level of individual fertility. By contrast, in Bihar, Gujarat, Haryana, Madhya Pradesh, Rajasthan and Uttar Pradesh, *GMFR*/*AMFR* is greater than 1 which suggests that the age distribution of married females in the reproductive age group, in these states, is skewed towards high fertility ages. In these states, the age structure of married females in the reproductive age group inflates population fertility at a given level of individual fertility.

Figure 2: Inter-state variations in fertility in India: 2001-03



Similarly, the proportion of married females to total females in the reproductive age group also varies widely across the states. In Rajasthan, the ratio *GFR/GMFR* is more than 0.80 whereas this ratio is only about 0.62 in Assam. This means that a given level of individual fertility, the general fertility rate is lower in Assam than in Rajasthan simply because around 80 per cent of the females in the reproductive age group were in marital union in Rajasthan compared to only around 62 per cent in Assam. On the other hand, the proportion of females in the reproductive age group to the total population, measured by the ratio *CBR/GFR* is more than 0.28 in Kerala and Tamil Nadu but less than 0.25 in Bihar, Madhya Pradesh, Rajasthan and Uttar Pradesh. This means that, at a given level of individual fertility, the population fertility is going to be higher in Kerala and Tamil Nadu than in Bihar because Kerala and Tamil Nadu had a higher proportion of females in the reproductive age group as compared to Bihar.

5. Fertility Transition

An assessment of fertility transition in India can be made by analysing the trend in population fertility as well as in individual fertility. For India as a whole, the trend in individual fertility has been different during the period 1985-1997 as compared to the period 1995-2003. During the period 1985-1997, individual fertility, measured in terms of *AMFR*, decreased at an average annual rate of more than 1.7 per cent per year but during the period 1995-2003, transition in individual fertility virtually stagnated as the *AMFR* decreased at an average annual rate of just -0.008 per cent per year only. In the rural areas, *AMFR* decreased at an average annual rate of -1.546 per cent per year during the period 1985-1997 but during the 1995-2003, it actually increased marginally at the rate of 0.043 per cent per year. Similarly, in the urban areas, the *AMFR* decreased at the rate of -2.078 per cent per year, on average, during the period 1985-97 but increased at the rate of 0.200 per cent per year during the post 1995-97 period. This trend in the *AMFR* indicates that individual fertility decline virtually stalled during the post 1995-97 in India.

In contrast to *AMFR*, the decrease in the population fertility, measured in terms of crude birth rate *CBR*, continued even during the post 1995-97 period, although, there was a marginal slow down in the rate of decline. During the period 1985-97, population fertility in the country as a whole decreased at an average annual rate of 1.625 per cent per year whereas during the period 1995-97 through 2001-03, it decreased at an average annual rate of 1.589 per cent year. This pattern prevailed in both rural and urban areas of the country also. The *CBR* in rural India decreased at an average annual rate of -1.542 per cent per year whereas the urban *CBR* decreased at an average annual rate of -1.420 per cent per year during the post 1995-97 period. Interestingly, the decline in the rural population fertility accelerated during the post 1995-97 period as compared to the period 1985-97. However, in the urban areas, decline in the population fertility slowed down considerably during the period 1995-03 as compared to the period 1985-97. In fact, during the period 1995-03, the crude birth rate decreased more rapidly in the rural areas than the crude birth rate in the urban areas.

Figure 3: Trends in *CBR* and *AMFR* in India: 1985-2003

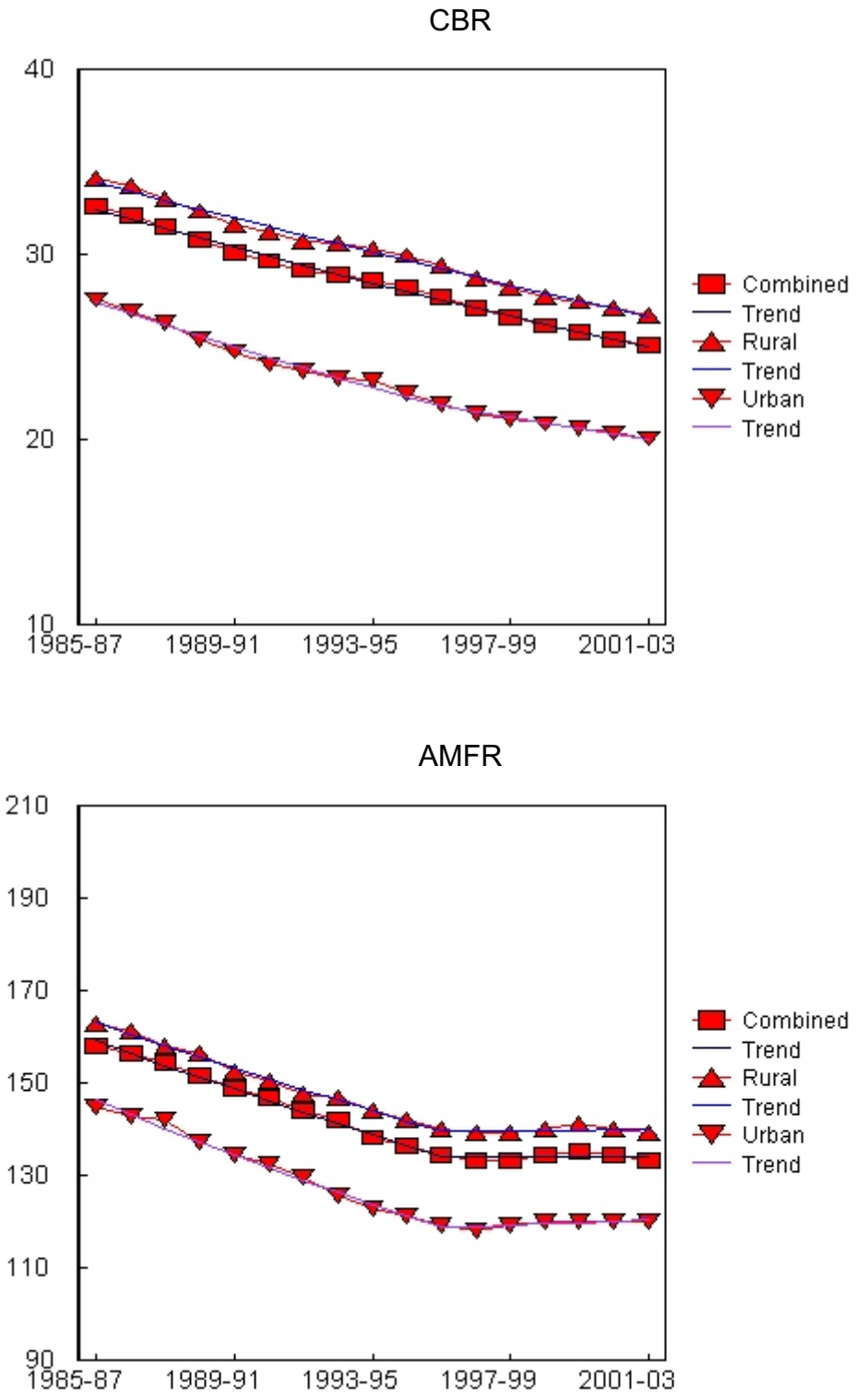
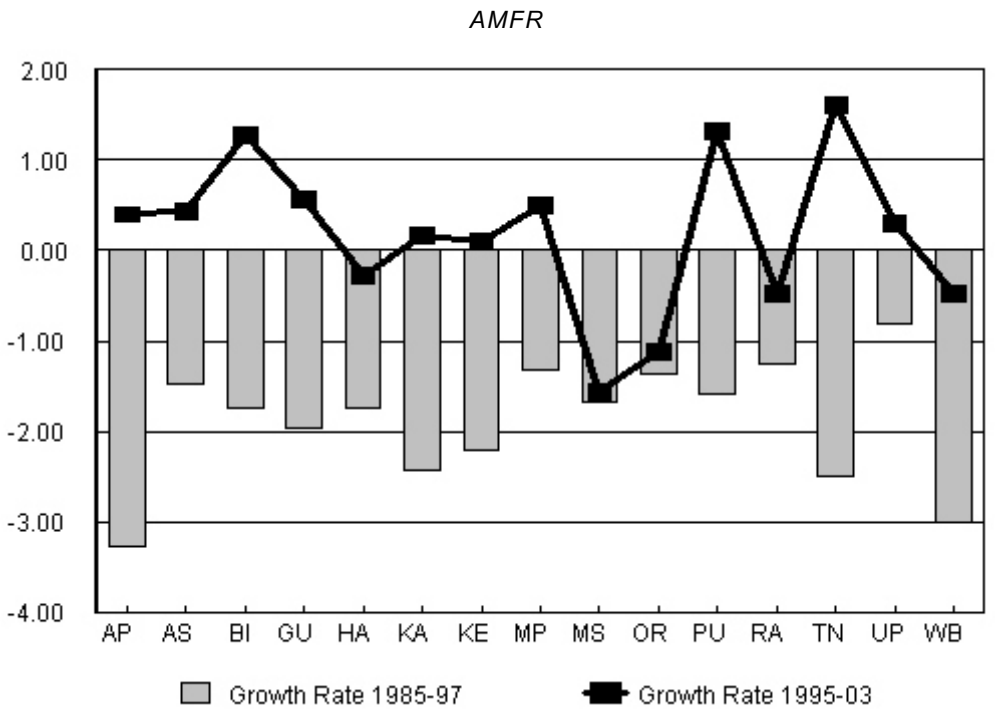
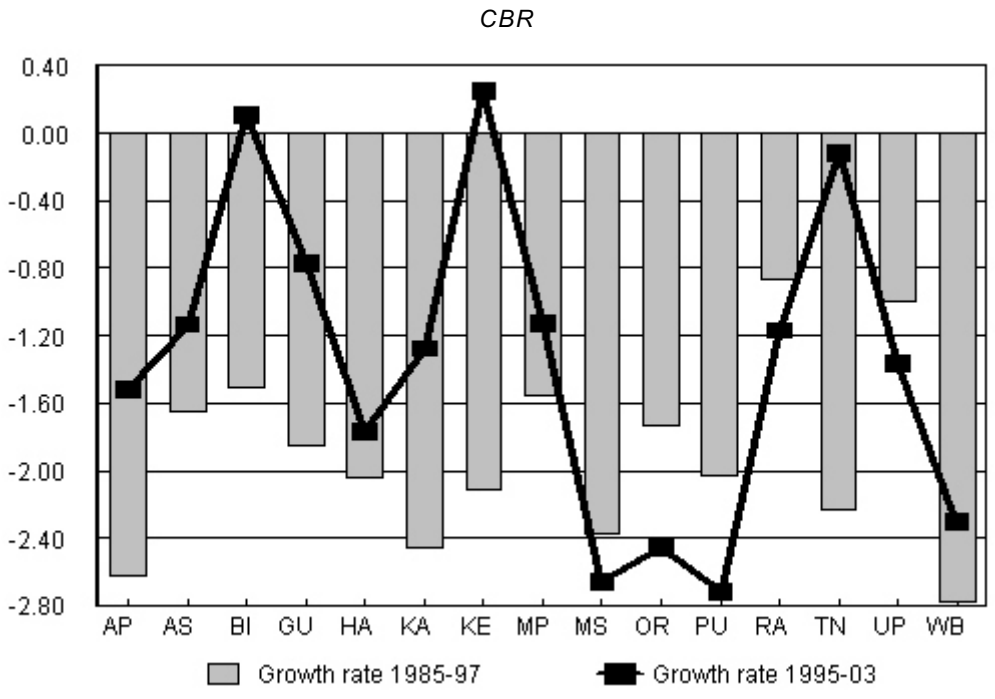


Figure 4: Average annual rate of decline in individual fertility and population fertility in Indian states: 1985-97 and 1995-03





The decrease in population fertility during the post 1995-97 period despite a stalling of the decline in individual fertility indicates that the decrease in the population fertility during the period 1995-03 had been the result of the changes in the age structure of the female population and changes in the female marriage patterns. In India, the age distribution of the married females in the reproductive age group shifted slowly to low fertility ages with the result that the ratio (*GMFR*/*AMFR*) decreased from 1.112 during 1985-87 to 1.007 during 2001-03. In the urban areas of the country, this ratio turned less than 1 over time which indicates that at a given level of individual fertility, the age distribution of married females in the reproductive age group induced a decrease, not increase, in population fertility. Similarly, the proportion of females of the reproductive age group in marital union decreased from around 77.5 per cent during 1985-87 to around 72.5 per cent during the period 2001-03 again inducing a decrease in population fertility at a given level of individual fertility. The proportion of females in the reproductive age group to the total population however, showed an increase but the decrease was marginal.

Among different states of the country, the speed of decline in *AMFR* varied during the period 1985-97 ranging from an average annual rate of decrease of almost 3.3 per cent in Andhra Pradesh and 3 per cent in West Bengal to less than 1 per cent in Uttar Pradesh. Uttar Pradesh was the only state in the country where *AMFR* decreased at an average annual rate of less than 1 per cent per year during the period 1985-97. In most of the states of the country, the average annual rate of decrease in *AMFR* ranged between 1-2 per cent per year whereas in Gujarat, Karnataka, Kerala and Tamil Nadu, *AMFR* decreased at a rate ranging between 2-3 per cent. However, during the period 1995-2003, the speed of decline in *AMFR* slowed down considerably and in 10 of the 15 states of the country included in the analysis, *AMFR*, instead of decreasing, actually increased. Out of the five states where *AMFR* continued to decrease even in the post 1995-97 period, the rate of decrease of a substantial magnitude could be achieved only in Maharashtra and Orissa. In the other three states - Haryana, Rajasthan and West Bengal - *AMFR* decreased at an average annual rate of less than 0.5 per cent per year which was substantially slower than the average annual rate of decrease during the 1985-97 period.

In the rural areas of different states also, *AMFR* increased in all states except Haryana, Maharashtra, Orissa, Rajasthan and West Bengal during the post 1995-97 period. In Maharashtra and Orissa, the pace of decline in rural *AMFR* was faster during the period 1995-97 as compared to the period 1985-97 whereas it was slower in Haryana, Rajasthan and West Bengal. In Maharashtra, rural *AMFR* decreased at an average annual rate of decrease of 2.613 per cent per year during the post 1995-97 period. This rate of decline was highest in the country. In contrast, in Tamil Nadu, *AMFR* increased at an average annual rate of 1.7 per cent per year during the same period.

In the urban areas of different states, on the other hand, *AMFR* continued to decrease during the post 1995-97 period in Assam, Gujarat, Karnataka, Kerala, Rajasthan and West Bengal but in none of these states, had *AMFR* decline accelerated as it did in Maharashtra and Orissa in case of rural *AMFR*. In the rest

of the states, *AMFR* increased and the average annual rate of increase was more than 2 per cent per year in Punjab. There are thus only two states in the country - Rajasthan and West Bengal - where individual fertility transition, measured in terms of *AMFR*, continued in both rural and urban populations during the post 1995-97 period. In other states, individual fertility declined either only in the rural or in the urban population or increased in both during the post 1995-97 period.

In contrast to individual fertility, transition in the population fertility continued in the post 1995-97 period in all states except Bihar and Kerala, although there was a slow down in the speed of decline in most of the states. During the period 1985-97, the average annual rate of decline in *CBR* was more than 2 per cent per year in 8 major states of the country with West Bengal recording the most rapid decline in *CBR*. By contrast, there were only two states - Rajasthan and Uttar Pradesh - where the average annual rate of decline in *CBR* was less than 1 per cent per year. During the period 1995-03, however, only 4 states achieved an average annual rate of decline of more than 2 per cent per year in *CBR* and in three of these four states - Maharashtra, Orissa and Punjab - the pace of decline accelerated during the post 1995-97 period as compared to the period 1985-97. In Gujarat and Tamil Nadu, population fertility, measured in terms of *CBR*, declined at an average annual rate of less than 1 per cent per year and in Bihar and Kerala, population fertility increased, albeit marginally.

The pace of decline in population fertility, measured in terms of *CBR*, in the rural areas of the country, on the other hand, accelerated in most of the states of the country in the post 1995-97 period as compared to the period, 1985-97. During this period, Maharashtra and Punjab achieved an average annual rate of decline of more than 3 per cent per year in the rural *CBR*. By contrast, the rural *CBR* increased marginally in Bihar, Kerala and Tamil Nadu in the post 1995-97 period whereas in Gujarat and Karnataka, the rural *CBR* decreased at an average annual rate of less than 1 per cent only during this period. In case of urban population, fertility recorded an increase during the post 1995-97 period only in Bihar, although, the pace of decline in urban *CBR* slowed down in all states except Assam and West Bengal. In West Bengal, the urban *CBR* decreased at an average annual rate of almost 3 per cent per year during the post 1995-97 period.

6. Decomposition of Transition in Population Fertility

Tables 5, 6 and 7 summarize the results of the decomposition of population fertility into its four components as discussed above. The analysis has been carried out separately for 1985-87 through 1995-97, as also for 1995-97 through 2001-03 because the trend in the individual fertility (*AMFR*) during 1985-97 has been different from the trend during the period 1995-03.

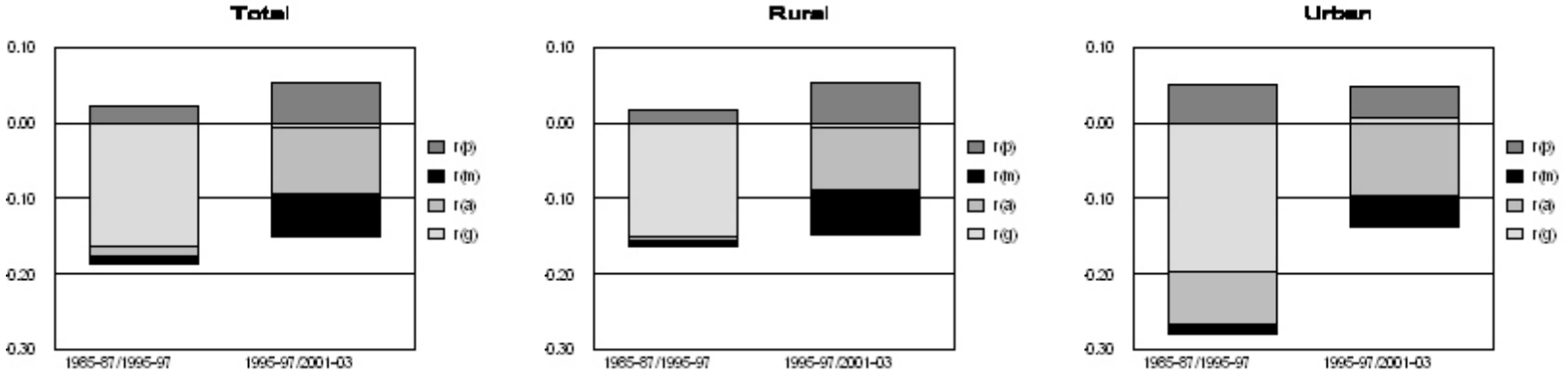
The decomposition exercise suggests that, during the period 1985-97, decline in population fertility *CBR* was dictated, almost entirely, by the decline in individual fertility *AMFR*. The contribution of the change in other components was, at best, marginal. For India as a whole, the *CBR* decreased by around 16.3 per cent between 1985-87 and 1995-97 and the decrease in *AMFR* was even faster. The same

happened in the rural areas also. In the urban areas, although, the decrease in *AMFR* was slower than the decrease in *CBR* yet the decrease in *AMFR* accounted for more than 86 per cent of the decrease. By comparison, there was little change in the age distribution of married females in the reproductive age group, the proportion of females married in the reproductive age group and the proportion of females in the reproductive age group to the total population. For the combined and for the rural population, the contribution of the change in these three components to the change in *CBR* was always less than 15 per cent. However, in the urban population, the contribution of the change in the age distribution of married females in the reproductive age group accounted for more than 30 per cent of the change in the *CBR*. Similarly, the change in the proportion of reproductive age females to the total population accounted for more than 20 per cent of the change in *CBR*, although in the opposite direction. However, change in the patterns of marriage of females contributed just around 5 per cent of the total change in *CBR* in the urban areas.

During 1995-97 through 2001-03, however, almost the entire decline in population fertility was accounted for by the change in the age structure of married females and changes in the proportion of married females in the reproductive age group. During the post 1995-97 period, the *CBR* in India decreased by about 9.9 per cent whereas the *AMFR* remained virtually stagnant. In fact, change in the age distribution of married females in the reproductive age group accounted for nearly 87 per cent of the change in *CBR* during this period. Decrease in the proportion of married females in the reproductive age group also accounted for nearly 60 per cent of the decrease in the *CBR* but the proportion of reproductive age females in the population accounted for an increase of about 5 per cent in the *CBR*. A similar situation prevailed in the rural areas but in the urban areas, transition in the age distribution of married females in the reproductive age group has been quite rapid while decrease in the proportion of married females in the reproductive age group and increase in the proportion of reproductive age females in the population was relatively slow when compared to the rural population. In fact, *AMFR* increased, albeit marginally, during the post 1995-97 period in the urban areas of the country.

Among different states, the pattern of contribution of the four components of population fertility was more or less the same. During the period 1985-87 through 1995-97, decrease in the individual fertility accounted for almost the entire decrease in population fertility in all the states but during the period 1995-97 through 2001-03, changes in the age structure of the female population and changes in female marriage patterns accounted for almost all decrease in population fertility as the decrease in the individual fertility either stalled or individual fertility increased during this period in all but three states - Kerala, Maharashtra and Orissa. In the rural areas of different states, the pattern of contribution was no different than that for the combined population but in the urban areas, decrease in the individual fertility accounted for a substantial decline in population fertility in the post 1995-97 period in Assam, Bihar, Gujarat, Kerala and Rajasthan. In Bihar and Rajasthan, in fact, decrease in urban individual fertility in the post 1995-97 period was more rapid than that in urban population fertility.

Figure 5: Contribution of change in individual fertility (*AMFR*), age distribution of married females in reproductive age group (*GMFR*/*AMFR*), proportion of females married in the reproductive age group (*GFR*/*GMFR*) and proportion of reproductive age females in the population (*CBR*/*GFR*) to change in population fertility (*CBR*) in India, 1985-97 and 1997-2003.



7. Stalling of Individual Fertility Decline

The foregoing analysis suggests that the decline in individual fertility, measured in terms of average fertility of married women in the reproductive age group (*AMFR*) almost stalled in India during the period 1995-97 through 2001-03. By definition, *AMFR* is the unweighted average of the age specific fertility rates of married women in the reproductive age group. As such, a first explanation of the stalling of *AMFR* decline should be explored by analysing the change in the age-specific marital fertility rates. Estimates of age-specific marital fertility rates for the quinquennials age groups of the reproductive period are available for the country and for its constituent states through the Sample Registration System for the total population as well as separately for rural and urban populations. An analysis of the trend in age-specific marital fertility rates during the period 1995-97 through 2001-03 reveals an interesting pattern of change in the fertility of married women at different ages of the reproductive period. For India as a whole, the fertility of married women in the age groups 15-19 years and 20-24 years has shown an increasing trend during the post 1995-97 period while there has been only a marginal decline in the fertility of married women in the age group 25-29 years. In fact, fertility decline of some substantial magnitude has taken place among married women with age at least 30 years only. At the same time, more than three-fourths of the total births taking place in the country during the period 1995-97 were confined to married women below 30 years of age. This indicates that efforts to regulate fertility within the marital union appear to have been wrongly focussed, either by design or by coincidence, on married women of those age groups which accounted for only a small proportion of the total birth performance in a year.

A similar situation appeared to have prevailed in the constituent states of the country. Out of the 30 average annual rates of change (15 each for the age groups 15-19 and 20-24 years, respectively) for the period 1995-97 through 2001-03, only 7 are negative and out of these 7 rates, only 3 are of some substantial magnitude. On the other hand, out of the 15 average annual rates of change in the age group 25-29 years, 10 are negative. However, out of these 10 negatives rates of change, the magnitude of the rate is substantial in only 5 states. At the same time, the proportion of births to married women below 30 years of age to the total number of births in a year varied from more than 90 per cent in Andhra Pradesh, Kerala and Tamil Nadu to 63-64 per cent in Bihar and Uttar Pradesh. Obviously, reduction in fertility of married women below 30 years of age is critical to reducing the individual fertility but this could happen only in Maharashtra and Orissa. Maharashtra and Orissa, incidently, are the two states where decline in individual fertility could be maintained even during the post 1995-97 period.

Following the Bongaarts model of proximate determinants of fertility (Bongaarts, 1978), changes in the fertility of married women in the reproductive age group is largely determined by three factors - prevalence of contraception, incidence of induced abortion and duration of post partum amenorrhoea resulting mainly from the fertility inhibiting effects of breastfeeding. Out of these three factors, prevalence of contraception is regarded as the most important one. Many empirical

studies suggest that there exists a strong linear relationship between the contraceptive prevalence rate among currently married women in the reproductive age group and the total fertility rate which explains between 72-91 per cent of the variations in the total fertility rate across countries (Bongaarts and Kirmeyer, 1982; Bongaarts, 1984; Mauldin and Segal, 1988; Westoff, 1990; World Bank, 1993; Pritchett, 1994; Westoff and Bankole, 2001). Bongaarts and Kirmeyer have also estimated a regression model for analysing the relationship between the prevalence of contraception among married women in the reproductive age and total marital fertility rate on the basis of data from 22 developing countries. The analysis suggests that increase in contraceptive prevalence has relatively less impact on the total marital fertility rate than on total fertility rate. Bongaarts and Kirmeyer argued that the reason for the relatively low correlation was that the contraceptive prevalence rate and proportion married among females of reproductive ages were correlated. Populations with a high contraceptive prevalence rate tended to have a relatively higher female age at first marriage and more marital disruption.

Estimates of contraceptive prevalence rate in India and its constituent states are available through the National Family Health Survey and the District Household Survey (International Institute for Population Sciences, 1995; 2000a; 2000b; 2005). for the period 1992-93, 1998-99 and the period 1998-99 and 2002-04. According to the District Household Survey, the contraceptive prevalence rate in India increased from 48.6 per cent in 1998-99 to 52.7 per cent 2002-04. Prevalence of contraception also increased in all states of the country except Kerala where it decreased marginally in 2002-04 as compared to 1998-99. However, despite an increase of more than 4 absolute points in the contraceptive prevalence rate over a period of 4 years at the national level, it appears that there has virtually been no decline in *AMFR*..

A number of explanations have been suggested for the stalling of the decline in average fertility of married women in the reproductive age group despite increase in the contraceptive prevalence rate. A comprehensive discussion on various explanations put forward and empirical support to the explanations given is examined in two recent studies which were carried out in the context of the observed low correlation between contraceptive prevalence and fertility in sub-Saharan Africa (Westoff and Bankole, 2001) and in the context of northeast Brazil (Curtis and Diamond, 1995). These studies argue that if increase in the contraceptive prevalence rate is confined to spacing and traditional methods only, then such an increase may not have a substantial impact on the average fertility of married women in the reproductive age group. This argument is based on the theory that the predominant use of contraception for spacing rather than for limiting births may dilute the association between contraceptive practice and fertility (Greene, 1998). It is argued that when contraception is practised for the purpose of spacing between successive births and not for limiting births, it is generally used only for short periods and probably irregularly with a primary motivation to postpone rather than to avoid the pregnancy. As such, its impact on the fertility of individual married women is at best limited.

Figure 6: Average annual rate of change in age-specific marital fertility rates in India: 1995-97 through 2001-03

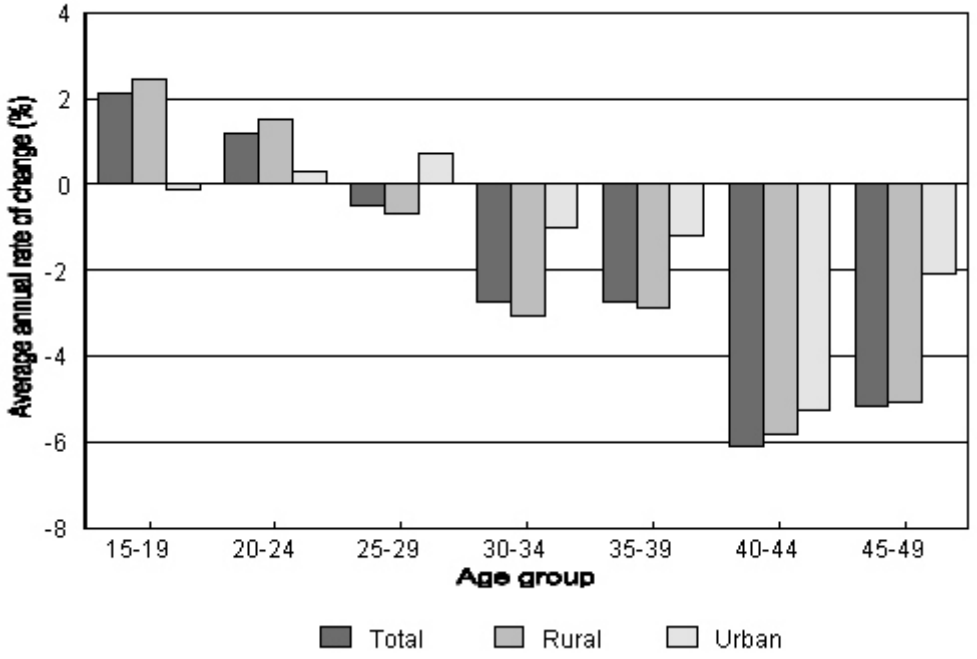
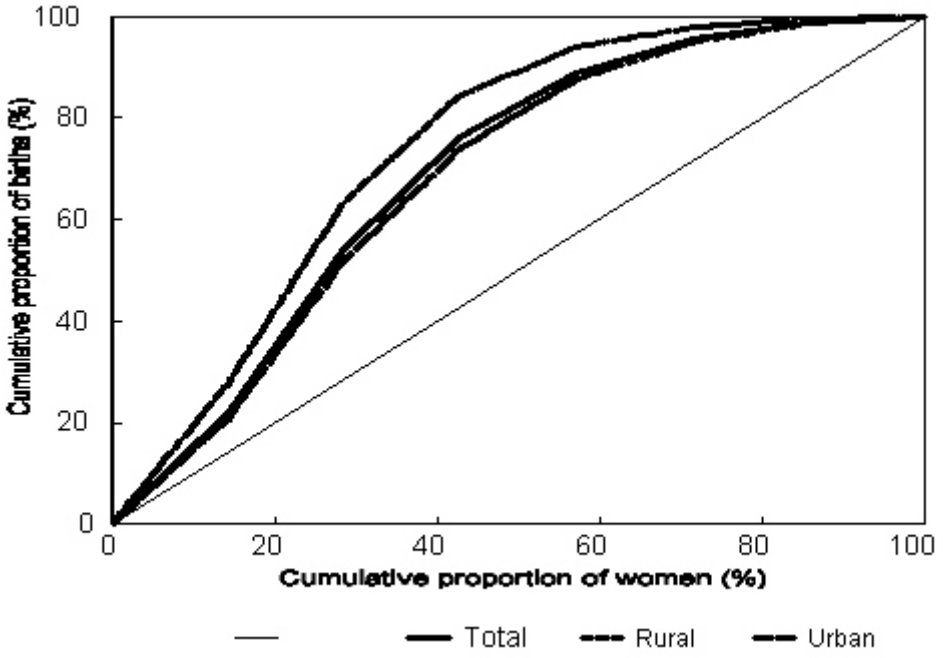


Figure 7: Distribution of annual number of births by the age of married women in reproductive age group in India: 1995-97



Information available through the District Household Survey suggests that virtually all increase in the contraceptive prevalence rate in India between 1998-99 and 2002-04 has been confined to an increase in the prevalence of modern spacing methods and traditional methods of contraception. The all-method contraceptive prevalence rate in India increased from 48.6 per cent in 1998-99 to 52.7 per cent during 2002-04. More than 95 per cent of this increase was due to an increase in the prevalence of either modern spacing or traditional methods of contraception. Increase in the prevalence of terminal methods accounted for less than 5 per cent of the increase in all methods contraceptive prevalence rate. On the other hand, the programme service statistics of the National Family Welfare Programme suggests that the proportion of couples effectively protected through the terminal methods - female and male sterilization - decreased from 30.2 per cent in 1995-96 to 29 per cent in 1999-2000 (Government of India, 2003).

The pattern of increase in the contraceptive prevalence rate during the period 1998-99 through 2002-04 has been drastically different from the pattern of increase during the period 1992-93 through 1998-99. According to the National Family Health Survey, the all-method contraceptive prevalence rate in India increased by more than 7 absolute points - from 40.7 per cent in 1992-93 to 48.2 in 1998-99 and more than two third of this increase was attributed to the increase in the prevalence of the terminal methods of contraception only. The increase in the prevalence of spacing methods of contraception accounted for less than one fourth of the increase while the traditional contraceptive methods accounted for the remaining increase in the all-method contraceptive prevalence rate.

It appears that the observed stalling of the decline in average marital fertility of married women in the reproductive age in India has been the result of virtually little increase in the prevalence of terminal methods of contraception during the post 1995-97 period. There has been some substantial increase in both modern spacing methods and traditional methods of contraception but there had been little impact of this increase on the average fertility of married women in the reproductive age group. One reason may be that these methods are primarily promoted for spacing between successive births and for limiting the total number of births. The other reason may be that the efficiency of the modern spacing methods and traditional methods in preventing or even postponing a birth has been very poor. Unfortunately, estimates of discontinuation rates and failure rates of different modern spacing and traditional methods of contraception are not available to enable the exploration of this issue further.

Among different states of the country, a similar situation appears to have prevailed, although, the link between the patterns of increase in the contraceptive prevalence rate and the nature of decrease in marital fertility is not as clear as it is at the national level. Although, the all-method contraceptive prevalence rate increased in all states, except Karnataka, between 1998-99 and 2002-04, yet the prevalence of terminal methods of contraception decreased in eight of the 15 major states. In fact, any substantial increase in the prevalence of terminal methods of contraception during the period 1998-99 through 2002-04 could be recorded in only two states -

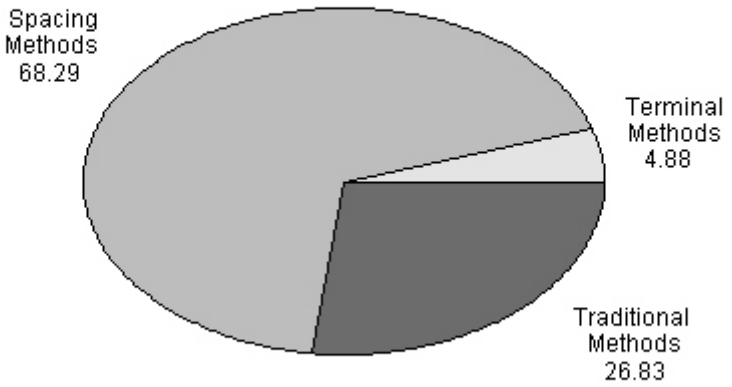
Andhra Pradesh and Tamil Nadu. In the rest of the states, increase in the prevalence of terminal methods of contraception never accounted for more than one fifth of the increase in the all-method contraceptive prevalence rate in any state of the country during the post 1995-97 period. This situation was radically different from the situation that prevailed during the period 1992-93 through 1998-99 when increase in the terminal methods of contraception accounted for more than two third of the increase in all methods contraceptive prevalence rate in 8 of the 15 states. It appears that the prevalence of terminal methods of contraception plateaued in the country during the post 1995-97 period which had a direct impact on the decline in the fertility of married women in the reproductive age group.

Andhra Pradesh and Karnataka, however, do not conform to the above pattern. In both these states, the average fertility of married women in the reproductive age group increased quite rapidly during the post 1995-97 period despite the fact that the prevalence of terminal methods of contraception also increased. In fact, the average annual increase in *AMFR* during the period 1995-97 through 2001-03 was highest in Tamil Nadu. It appears that, at the state level, other proximate determinants of the fertility of married women in the reproductive age group, particularly, incidence of induced abortion and duration of post-partum amenorrhoea, etc. played a much more dominating role in deciding the levels of marital fertility than the role played by the practice of contraception. For example, increase in average marital fertility despite an increase in the prevalence of terminal methods of contraception in Andhra Pradesh and Tamil Nadu may be due to a decrease in the duration of post partum amenorrhoea resulting primarily from a decrease in the prevalence and duration of breastfeeding. One reason may be the fear of mother to child transmission of HIV/AIDS as the prevalence of HIV/AIDS in the two states is highest in the country (Government of India, 2006). Similarly, the introduction of the Pre-natal Diagnostic Techniques (Regulation and Prevention of Misuse) Act in the year 1994 (Government of India, 1994) might have resulted in a decrease in the incidence of induced abortion, at least the legal and safe abortions by a qualified person, that might have contributed to the increase in the average fertility of married women in the reproductive age group.

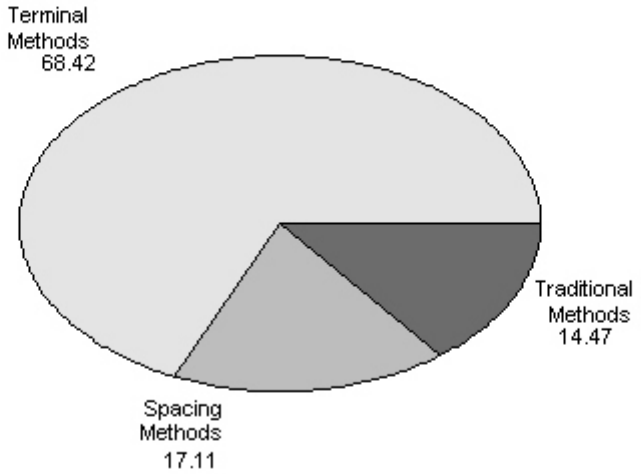
On the other hand, *AMFR* continued to decrease in Haryana, Maharashtra, Orissa, and Rajasthan despite a decrease in the terminal methods of contraception during the post 1995-97 period. In Maharashtra and Orissa, marital fertility decreased in all age groups and it is difficult to ascertain to what extent, prevalence of contraception influenced this decline. On the other hand, in Haryana and Rajasthan, marital fertility increased in the age groups 15-19 and 20-24 years during the post 1995-97 period despite increase in the modern spacing methods of contraception. In Orissa, the prevalence of modern spacing methods of contraception increased by nearly 7 absolute points between 1998-99 and 2002-04 and more than nearly three-fourth of this increase was due to an increase in the prevalence of the oral pill as a contraceptive method. In Haryana, on the other hand, increase in the prevalence of the condom accounted for about 60 per cent of the increase in the prevalence of modern spacing methods of contraception.

Figure 8: Contribution of increase in terminal methods, spacing methods and traditional methods of contraception to increase in all-method contraceptives prevalence rate in India.

1998-99/2002-04



1992-93/1998-99

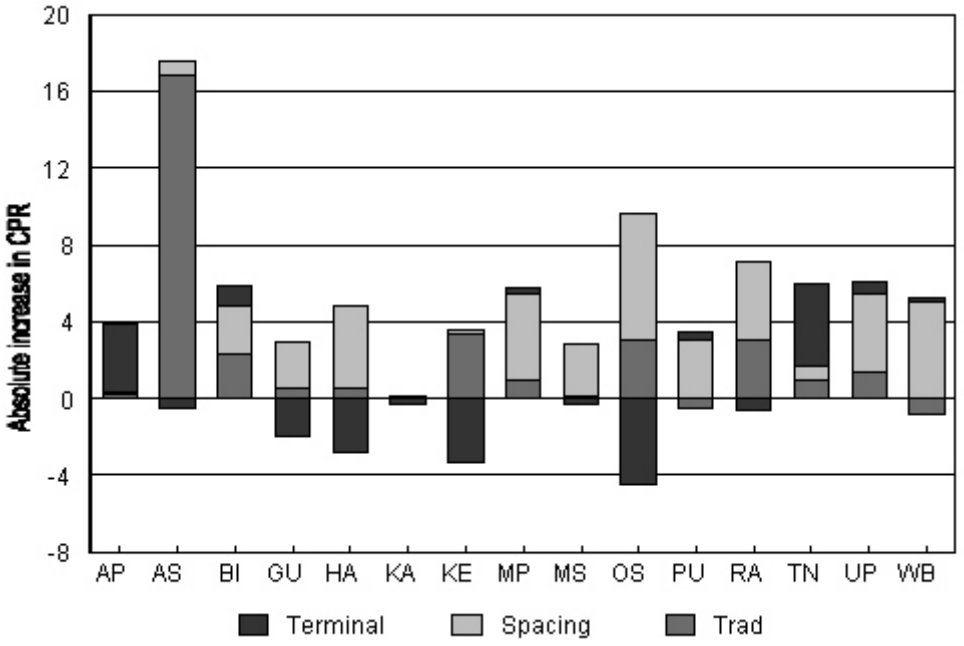


The stalling of the decline in individual fertility and the shift in the contraceptives method mix in India in the post 1995-97 period has been coterminous with a paradigm shift in the basic approach in the implementation of the National Family Welfare Programme. The National Family Welfare Programme in India has been known for its top-down, target-based approach of implementation and a bias towards terminal methods of family planning to achieve pre-defined demographic goals. This approach had frequently invited the wrath of international agencies and demographers. It was argued that the target-based system of implementation suffered from the negligence of the quality of services provided to the beneficiaries of the programme as the family welfare needs of the individual beneficiary were not properly met. Following the consensus arrived at the 1994 International Conference on Population and Development at Cairo (United Nations, 1994) and on the basis of the recommendations put forward by the World Bank (Measham and Heaver, 1996), the Government of India induced a major policy shift in the basic approach to the programme in 1996. This new approach expanded the narrow family planning based focus of the Programme to a broad reproductive and child health based canvass. As the first step to operationalize this policy shift, the system of allocating targets from the top in terms of new acceptors of different methods of family planning to be recruited every year was replaced by an alternative approach which was initially termed as the 'target free' approach and subsequently 'community needs assessment' approach (Government of India, 1998). This new approach essentially consisted of assessing the family welfare needs of the people and meeting these needs through the provision of services of high quality. The empirical basis for the new approach was provided by the National Family Health Survey, the first round of which was carried out throughout the country during 1992-93. This survey revealed that there existed a substantial unmet need of family planning (International Institute for Population Sciences, 1995). It was argued on the basis of this finding that significant achievements in terms of fertility reduction could be achieved just by meeting the unmet need of family planning. As such, the National Population Policy, announced in the year 2000, focussed primarily on reducing the unmet need for family planning in the achieving replacement fertility by the year 2010 (Government of India, 2000).

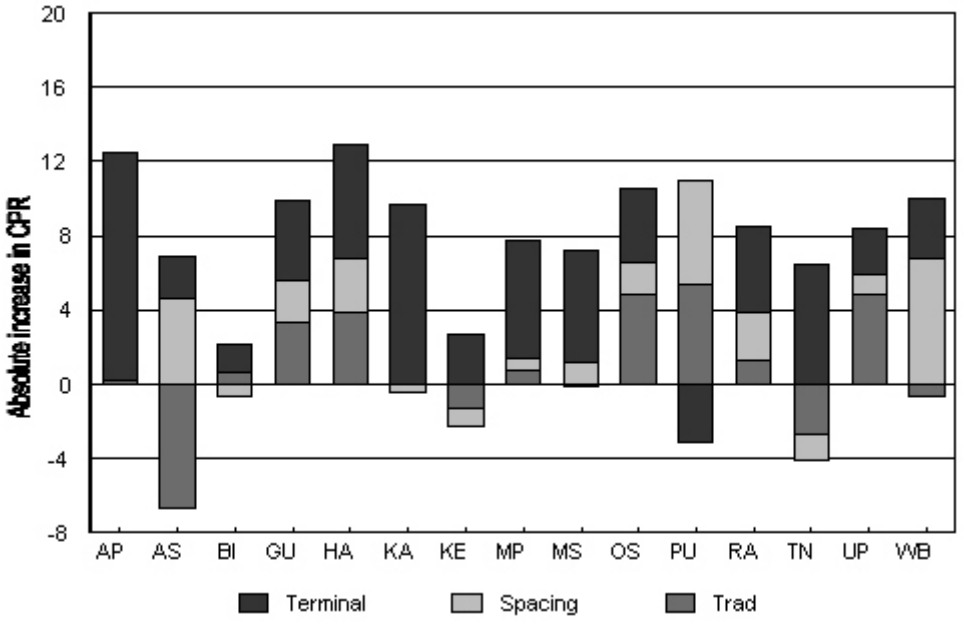
The introduction of the 'target free' or the subsequent renamed 'community needs assessment' approach for the implementation of the National Family Welfare Programme, however, appears to have resulted in a setback in terms of the couples effectively protected. The Programme ultimately showed signs of recovery after a time lag but there had been a clear shift in the contraceptive methods mix towards the spacing methods of contraception at the cost of terminal methods of contraception in the country as a whole as well as in all states and Union territories. As a result, nearly all increase in the contraceptive prevalence rate was accounted for by an increase in the modern spacing methods of contraception and even traditional contraceptive methods as discussed above. At the national level, such an increase failed to induce a decline in the fertility of married women.

Figure 9: Contribution of change in prevalence of terminal methods, spacing methods and traditional methods of contraception on increase in all methods contraceptive prevalence rate in Indian states.

1998-99/2002-04



1992-93/1998-99



It is out of context here to discuss the factors responsible for the poor performance of the National Family Welfare Programme under the 'target free' or 'community needs assessment' approach. However, available empirical evidence suggests that a change in the contraceptive methods mix resulting from the shift in the basic approach of the implementation of the National Family Welfare Programme has largely been responsible for either stalling the individual fertility decline at the national level or even increasing it in a number of states.

8. Conclusions

The good sign is that population fertility, measured in terms of the crude birth rate, is declining in the country but the bad omen is that individual fertility has stagnated at the national level since 1995-97 and increased in a number of states. The stagnation in individual fertility suggests that decline in the population fertility in the post 1995-97 period has largely been the result of changes in the age structure of the female population and transition in female marriage patterns. It appears that fertility reduction efforts lost direction after the introduction of 'community needs assessment' approach under the National Family Welfare Programme. Although, a reintroduction of targets under the Programme is ruled out, yet it is necessary to critically analyse the operationalization of the 'community needs assessment' approach to ensure that the increase in the contraceptive prevalence rate do have a telling impact on individual fertility.

The 'target free' or the 'community needs assessment' approach, essentially, relies upon the local capability for collecting statistically reliable and relevant information about the family welfare needs of the people and using this information for evidence-based decision making. Unfortunately little thought was given to explore the local capacity and capability of the grass roots level family welfare services providers before the introduction of the approach. Moreover, tools for an objective assessment of the family welfare needs of the people could never be developed to facilitate the implementation of the 'community needs assessment' approach. In the absence of well-defined procedures and tools, the programme management at the local level, out of sheer desperation or design adopted the erstwhile targets as the expected level of achievement thereby jeopardising the very basis of the approach.

The present analysis clearly highlights the need for reinvigorating the 'community needs assessment' approach in sustaining and even accelerating individual fertility decline in India. There is a requirement for substantive capacity building at the local level at least in two contexts. The first is the local level need-based planning for family welfare services delivery. The bottom up planning for fertility reduction and population stabilization can succeed only when the bottom - the grass roots level family welfare services providers - develops the capacity for assessing the family welfare needs in an objective manner and using the knowledge so gained in providing quality family welfare services in an efficient manner. This requires both the development of necessary tools and developing necessary skills and competency. The grass roots level family welfare services provider has

traditionally been entrusted with the task of providing services to a targeted number of couples only. As such, s/he could develop neither the capacity to carry out the planning task which, in any case, is more technical and more intensive than the delivery of family planning services nor could s/he develop the skills necessary for an objective monitoring and evaluation of the impact of the services provided. The real challenge is how to turn a minimally trained family welfare services provider into a grass-roots level manager of the National Family Welfare Programme.

The second requirement for the successful implementation of the 'community needs assessment' approach is the development of an alternative system of monitoring and evaluation. Although, it is now more than 10 years since the 'community needs assessment' approach was introduced, yet there has been little attempt to modify the monitoring and evaluation framework that was evolved under the 'target regime.' Monitoring continues to remain a number game with the word 'target' replaced by the term 'expected level of achievement' and quality issues continue to be grossly neglected in the whole monitoring process. On the other hand, evaluation of fertility reduction and population stabilization efforts and activities remain an isolated activity with little linkage to planning, implementation and monitoring of family welfare service delivery at the local level. For successfully operationalizing and institutionalizing the 'community needs assessment' approach, it is necessary that links are established between the planning, monitoring and evaluation functions of family welfare services delivery. It is obvious that such a link can be established at the grass roots level only where all family welfare services are provided. Conducting ad-hoc sample surveys even at regular intervals may contribute to policy makers and programme managers at the top in terms of presenting a macro picture of the prevailing situation but these surveys contribute little to the grass roots level family welfare services provider. One way to integrate planning, monitoring and evaluation of family welfare services delivery at the grass roots level is to develop and institutionalize a couple-based monitoring system. There is however little initiative to develop an integrated system of planning, monitoring and evaluation of family welfare activities at the grass roots level even under the 'community needs assessment' approach.

The analysis also suggests that the scope of sterilization-based approach to fertility reduction in India is, at best, limited. Most of the fertility in the country is now confined to married women below 30 years of age and the trend in the fertility of these women is largely independent of the trend in the prevalence of terminal methods like sterilization. Moreover, the fertility of married women with at least 30 years of age has already reached very low levels. The only way out therefore is to improve the efficiency and effectiveness of the modern spacing methods of contraception and replacing the use of traditional contraceptive methods through the modern spacing methods. This remains a challenging task as the National Family Welfare Programme continues to be highly bureaucratic and top down despite all advocacy about the 'community needs assessment' approach.

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Table 1	Fertility levels and trends in India: 1985-2003							
Period	TMFR	AMFR	GMFR/ AMFR	GMFR	GFR/ GMFR	GFR	CBR/ GFR	CBR
				Total Population				
1985-87	5.5	158.1	1.112	175.9	0.775	136.3	0.239	32.6
1986-88	5.5	156.2	1.110	173.3	0.772	133.8	0.240	32.1
1987-89	5.4	154.3	1.106	170.7	0.764	130.4	0.241	31.4
1988-90	5.3	151.4	1.103	167.0	0.761	127.1	0.242	30.8
1989-91	5.2	148.6	1.095	162.7	0.757	123.2	0.244	30.1
1990-92	5.1	146.7	1.086	159.2	0.757	120.6	0.246	29.6
1991-93	5.0	143.8	1.087	156.3	0.756	118.1	0.247	29.1
1992-94	5.0	141.9	1.091	154.8	0.761	117.8	0.245	28.9
1993-95	4.8	138.1	1.105	152.6	0.769	117.3	0.244	28.6
1994-96	4.8	136.2	1.102	150.1	0.772	115.9	0.243	28.2
1995-97	4.7	134.3	1.097	147.3	0.768	113.1	0.245	27.7
1996-98	4.7	133.3	1.081	144.1	0.761	109.6	0.247	27.1
1997-99	4.7	133.3	1.062	141.6	0.752	106.5	0.250	26.6
1998-2000	4.7	134.3	1.041	139.8	0.745	104.2	0.251	26.1
1999-2001	4.7	135.2	1.022	138.3	0.736	101.8	0.253	25.8
2000-02	4.7	134.3	1.016	136.4	0.732	99.8	0.255	25.4
2001-03	4.7	133.3	1.007	134.2	0.725	97.3	0.258	25.1

Table 1	Fertility levels and trends in India: 1985-2003							
Period	TMFR	AMFR	GMFR/ AMFR	GMFR	GFR/ GMFR	GFR	CBR/ GFR	CBR
				Rural Population				
1985-87	5.7	162.9	1.119	182.3	0.794	144.8	0.235	34.1
1986-88	5.6	161.0	1.119	180.0	0.790	142.3	0.237	33.7
1987-89	5.5	158.1	1.123	177.5	0.783	139.0	0.237	33.0
1988-90	5.5	156.2	1.116	174.3	0.780	135.9	0.238	32.3
1989-91	5.3	152.4	1.116	170.0	0.775	131.8	0.240	31.6
1990-92	5.3	150.5	1.108	166.8	0.774	129.1	0.241	31.2
1991-93	5.2	147.6	1.113	164.2	0.771	126.7	0.243	30.7
1992-94	5.1	146.7	1.115	163.5	0.778	127.1	0.241	30.6
1993-95	5.0	143.8	1.122	161.3	0.786	126.8	0.239	30.3
1994-96	5.0	141.9	1.120	159.0	0.792	126.0	0.238	29.9
1995-97	4.9	140.0	1.115	156.0	0.788	123.0	0.239	29.4
1996-98	4.9	139.0	1.098	152.7	0.780	119.1	0.241	28.7
1997-99	4.9	139.0	1.080	150.2	0.771	115.8	0.243	28.2
1998-2000	4.9	140.0	1.061	148.6	0.764	113.6	0.244	27.7
1999-2001	4.9	141.0	1.045	147.3	0.756	111.4	0.246	27.4
2000-02	4.9	140.0	1.039	145.4	0.750	109.1	0.248	27.1
2001-03	4.9	139.0	1.027	142.8	0.742	106.0	0.252	26.7

Table 1	Fertility levels and trends in India: 1985-2003							
Period	TMFR	AMFR	GMFR/ AMFR	GMFR	GFR/ GMFR	GFR	CBR/ GFR	CBR
				Urban Population				
1985-87	5.1	144.8	1.060	153.5	0.716	109.8	0.251	27.5
1986-88	5.0	142.9	1.048	149.8	0.713	106.8	0.252	26.9
1987-89	5.0	141.9	1.034	146.7	0.704	103.3	0.255	26.3
1988-90	4.8	137.1	1.029	141.1	0.703	99.2	0.256	25.4
1989-91	4.7	134.3	1.018	136.7	0.700	95.7	0.259	24.7
1990-92	4.6	132.4	0.999	132.3	0.702	92.8	0.259	24.0
1991-93	4.5	129.5	1.004	130.0	0.707	92.0	0.258	23.7
1992-94	4.4	125.7	1.013	127.4	0.712	90.8	0.257	23.3
1993-95	4.3	122.9	1.022	125.6	0.718	90.2	0.257	23.2
1994-96	4.2	121.0	1.002	121.2	0.711	86.2	0.261	22.5
1995-97	4.2	119.0	0.988	117.6	0.707	83.2	0.264	21.9
1996-98	4.1	118.1	0.971	114.6	0.702	80.5	0.266	21.4
1997-99	4.2	119.0	0.954	113.5	0.697	79.2	0.267	21.1
1998-2000	4.2	120.0	0.937	112.4	0.692	77.8	0.268	20.8
1999-2001	4.2	120.0	0.926	111.1	0.685	76.2	0.270	20.6
2000-02	4.2	120.0	0.910	109.2	0.682	74.5	0.273	20.3
2001-03	4.2	120.0	0.897	107.6	0.678	72.9	0.275	20.0

Source: Sample Registration System

Table 2	Fertility levels in Indian states: 2003							
State	TMFR	AMFR	GMFR/ AMFR	GMFR	GFR/ GMFR	GFR	CBR/GFR	CBR
				Total Population				
Andhra Pradesh	3.7	104.8	0.945	99.0	0.769	76.1	0.272	20.7
Assam	6.0	172.4	0.909	156.7	0.628	98.4	0.271	26.6
Bihar	5.5	156.2	1.074	167.8	0.773	129.7	0.239	30.9
Gujarat	4.1	118.1	1.077	127.2	0.734	93.4	0.265	24.8
Haryana	4.6	132.4	1.051	139.1	0.754	104.9	0.253	26.6
Karnataka	4.3	122.9	0.929	114.1	0.694	79.2	0.278	22.0
Kerala	3.5	101.0	0.831	83.9	0.694	58.3	0.291	17.0
Madhya Pradesh	5.3	151.4	1.062	160.8	0.776	124.8	0.245	30.5
Maharashtra	3.7	106.7	0.998	106.4	0.733	78.0	0.260	20.3
Orissa	4.4	124.8	0.993	123.9	0.696	86.2	0.270	23.2
Punjab	5.0	141.9	0.804	114.1	0.683	77.9	0.268	20.9
Rajasthan	4.8	137.1	1.140	156.4	0.802	125.5	0.244	30.7
Tamil Nadu	4.0	115.2	0.818	94.3	0.704	66.4	0.281	18.6
Uttar Pradesh	6.1	173.3	1.077	186.6	0.730	136.2	0.233	31.7
West Bengal	4.0	115.2	0.901	103.8	0.724	75.1	0.273	20.5

Table 2	Fertility levels in Indian states: 2003							
State	TMFR	AMFR	GMFR/ AMFR	GMFR	GFR/ GMFR	GFR	CBR/GFR	CBR
				Rural Population				
Andhra Pradesh	3.7	104.8	0.960	100.6	0.785	78.9	0.268	21.1
Assam	6.2	177.1	0.922	163.3	0.630	102.9	0.268	27.5
Bihar	5.6	160.0	1.074	171.9	0.782	134.4	0.237	31.9
Gujarat	4.4	126.7	1.091	138.2	0.744	102.8	0.259	26.6
Haryana	4.7	133.3	1.089	145.2	0.763	110.8	0.249	27.6
Karnataka	4.4	125.7	0.962	120.9	0.707	85.5	0.274	23.4
Kerala	3.4	97.1	0.876	85.1	0.696	59.2	0.289	17.1
Madhya Pradesh	5.5	157.1	1.084	170.3	0.802	136.5	0.238	32.4
Maharashtra	3.6	101.9	1.050	107.0	0.761	81.5	0.253	20.6
Orissa	4.4	125.7	1.005	126.3	0.702	88.7	0.268	23.7
Punjab	5.1	144.8	0.830	120.2	0.685	82.3	0.264	21.8
Rajasthan	5.0	142.9	1.144	163.4	0.813	132.8	0.241	32.0
Tamil Nadu	4.1	117.1	0.838	98.2	0.707	69.4	0.276	19.2
Uttar Pradesh	6.2	177.1	1.080	191.3	0.748	143.1	0.228	32.7
West Bengal	4.1	118.1	0.963	113.8	0.741	84.3	0.268	22.6

Table 2	Fertility levels in Indian states: 2003							
State	TMFR	AMFR	GMFR/ AMFR	GMFR	GFR/ GMFR	GFR	CBR/GFR	CBR
				Urban Population				
Andhra Pradesh	3.7	104.8	0.899	94.1	0.723	68.1	0.283	19.3
Assam	4.7	134.3	0.754	101.2	0.613	62.0	0.295	18.3
Bihar	4.6	130.5	1.034	134.9	0.705	95.1	0.246	23.4
Gujarat	3.4	97.1	1.077	104.6	0.714	74.7	0.279	20.9
Haryana	4.3	123.8	0.940	116.4	0.723	84.2	0.269	22.6
Karnataka	4.1	116.2	0.845	98.2	0.666	65.4	0.288	18.8
Kerala	3.9	111.4	0.722	80.4	0.690	55.5	0.295	16.4
Madhya Pradesh	4.5	128.6	0.944	121.4	0.686	83.3	0.273	22.8
Maharashtra	4.1	118.1	0.892	105.4	0.688	72.5	0.273	19.8
Orissa	4.6	131.4	0.801	105.3	0.649	68.3	0.286	19.6
Punjab	4.5	129.5	0.745	96.5	0.677	65.3	0.279	18.2
Rajasthan	3.8	109.5	1.118	122.4	0.756	92.5	0.263	24.3
Tamil Nadu	4.0	113.3	0.762	86.3	0.700	60.4	0.290	17.5
Uttar Pradesh	5.6	161.0	1.012	162.8	0.649	105.6	0.254	26.8
West Bengal	3.6	102.9	0.712	73.2	0.675	49.4	0.283	14.0

Source: Sample Registration System

Table 3	Average annual growth rate of *AMFR* in India and states: 1985-87 through 2001-03.					
Country/State	Total		Rural		Urban	
	1986-1996	1996-2002	1986-1996	1996-2002	1986-1996	1996-2002
India	-1.696	-0.008	-1.546	0.043	-2.078	0.200
Andhra Pradesh	-3.278	0.400	-3.218	0.131	-3.052	0.904
Assam	-1.468	0.432	-1.447	0.494	-1.980	-1.193
Bihar	-1.748	1.265	-1.685	1.317	-2.274	0.904
Gujarat	-1.965	0.563	-1.705	1.166	-2.566	-2.274
Haryana	-1.746	-0.266	-1.884	-0.549	-1.390	0.401
Karnataka	-2.431	0.157	-2.410	0.243	-2.176	-0.200
Kerala	-2.209	0.094	-2.365	0.058	-1.587	-0.797
Madhya Pradesh	-1.309	0.502	-1.169	0.502	-2.469	1.106
Maharashtra	-1.669	-1.561	-1.633	-2.613	-2.176	0.501
Orissa	-1.353	-1.112	-1.227	-1.331	-1.980	1.207
Punjab	-1.579	1.325	-1.449	1.015	-2.274	2.020
Rajasthan	-1.254	-0.483	-1.079	-0.473	-1.784	-1.390
Tamil Nadu	-2.504	1.602	-2.674	1.700	-2.274	1.715
Uttar Pradesh	-0.817	0.294	-0.906	0.371	-0.698	0.300
West Bengal	-3.008	-0.483	-3.347	-0.725	-2.469	-0.399

Source: Author's calculations.

Table 4	Average annual growth rate of *CBR* in India and states: 1985-87 through 2001-03.					
Country/State	Total		Rural		Urban	
	1986-1996	1996-2002	1986-1996	1996-2002	1986-1996	1996-2002
India	-1.625	-1.589	-1.477	-1.542	-2.246	-1.420
Andhra Pradesh	-2.623	-1.520	-2.533	-1.586	-2.807	-1.418
Assam	-1.652	-1.132	-1.492	-1.140	-1.556	-2.469
Bihar	-1.504	0.108	-1.399	0.097	-2.477	0.775
Gujarat	-1.852	-0.774	-1.559	-0.409	-2.555	-1.650
Haryana	-2.038	-1.767	-1.896	-1.984	-2.549	-1.151
Karnataka	-2.459	-1.275	-2.358	-0.981	-2.463	-2.160
Kerala	-2.116	0.248	-2.016	0.325	-2.445	-0.296
Madhya Pradesh	-1.552	-1.122	-1.366	-1.002	-3.392	-0.154
Maharashtra	-2.378	-2.654	-2.282	-3.649	-2.317	-1.030
Orissa	-1.734	-2.452	-1.644	-2.556	-2.227	-1.139
Punjab	-2.029	-2.720	-1.470	-3.049	-3.837	-1.760
Rajasthan	-0.866	-1.169	-0.717	-1.234	-1.663	-1.101
Tamil Nadu	-2.230	-0.119	-2.117	0.011	-2.478	-0.429
Uttar Pradesh	-0.999	-1.363	-1.048	-1.411	-1.034	-1.012
West Bengal	-2.779	-2.302	-2.378	-2.571	-2.250	-2.908

Source: Author's calculations.

Table 5	Contribution of change in *AMFR*, *GMFR*/*AMFR*, *GFR*/*GMFR*, and *CBR*/*GFR* to change in CBR - Total Population.					
Country/State	Period	*Index of change*				
		r_b	r_g	r_a	r_m	r_p
India	1985-87/1995-97	-0.163	-0.163	-0.014	-0.009	0.023
	1995-97/2001-03	-0.099	-0.007	-0.086	-0.058	0.052
Andhra Pradesh	1985-87/1995-97	-0.278	-0.324	-0.010	0.010	0.046
	1995-97/2001-03	-0.113	0.028	-0.148	-0.050	0.058
Assam	1985-87/1995-97	-0.193	-0.150	-0.057	0.052	-0.037
	1995-97/2001-03	-0.063	0.011	-0.120	-0.041	0.087
Bihar	1985-87/1995-97	-0.145	-0.151	0.020	-0.036	0.023
	1995-97/2001-03	-0.033	0.031	-0.049	-0.060	0.046
Gujarat	1985-87/1995-97	-0.208	-0.201	-0.041	-0.007	0.041
	1995-97/2001-03	-0.049	0.024	-0.075	-0.028	0.030
Haryana	1985-87/1995-97	-0.193	-0.178	-0.031	-0.007	0.023
	1995-97/2001-03	-0.088	-0.000	-0.111	-0.051	0.074
Karnataka	1985-87/1995-97	-0.226	-0.209	-0.079	0.030	0.032
	1995-97/2001-03	-0.054	0.000	-0.080	-0.028	0.054
Kerala	1985-87/1995-97	-0.225	-0.214	-0.134	0.081	0.042
	1995-97/2001-03	-0.057	-0.064	-0.037	0.044	-0.001
Madhya Pradesh	1985-87/1995-97	-0.149	-0.127	-0.007	-0.032	0.017
	1995-97/2001-03	-0.061	0.025	-0.075	-0.058	0.046
Maharashtra	1985-87/1995-97	-0.215	-0.148	-0.052	-0.018	0.004
	1995-97/2001-03	-0.153	-0.110	-0.049	-0.042	0.047
Orissa	1985-87/1995-97	-0.147	-0.126	-0.029	-0.028	0.035
	1995-97/2001-03	-0.154	-0.081	-0.076	-0.054	0.056
Punjab	1985-87/1995-97	-0.181	-0.130	-0.083	0.001	0.032
	1995-97/2001-03	-0.136	0.084	-0.232	-0.041	0.053
Rajasthan	1985-87/1995-97	-0.128	-0.156	0.014	-0.030	0.045
	1995-97/2001-03	-0.061	-0.027	-0.039	-0.046	0.051
Tamil Nadu	1985-87/1995-97	-0.209	-0.213	-0.045	0.004	0.044
	1995-97/2001-03	-0.051	0.060	-0.112	-0.016	0.017
Uttar Pradesh	1985-87/1995-97	-0.099	-0.081	0.024	-0.045	0.003
	1995-97/2001-03	-0.074	0.028	-0.063	-0.088	0.049
West Bengal	1985-87/1995-97	-0.266	-0.296	-0.044	0.025	0.049
	1995-97/2001-03	-0.114	-0.008	-0.143	-0.032	0.069

Source: Author's calculations

Table 6	Contribution of change in *AMFR*, *GMFR*/*AMFR*, *GFR*/*GMFR*, and *CBR*/*GFR* to change in CBR - Rural Population.					
Country/State	Period	*Index of change*				
		r_b	r_g	r_a	r_m	r_p
India	1985-87/1995-97	-0.147	-0.151	-0.004	-0.008	0.016
	1995-97/2001-03	-0.096	-0.007	-0.082	-0.060	0.052
Andhra Pradesh	1985-87/1995-97	-0.265	-0.319	-0.002	0.013	0.043
	1995-97/2001-03	-0.119	0.009	-0.137	-0.051	0.061
Assam	1985-87/1995-97	-0.179	-0.147	-0.044	0.049	-0.037
	1995-97/2001-03	-0.064	0.016	-0.119	-0.044	0.083
Bihar	1985-87/1995-97	-0.136	-0.150	0.031	-0.034	0.016
	1995-97/2001-03	-0.033	0.043	-0.059	-0.063	0.047
Gujarat	1985-87/1995-97	-0.184	-0.178	-0.034	0.002	0.027
	1995-97/2001-03	-0.025	0.038	-0.057	-0.034	0.028
Haryana	1985-87/1995-97	-0.180	-0.193	0.002	-0.006	0.018
	1995-97/2001-03	-0.092	-0.007	-0.105	-0.061	0.080
Karnataka	1985-87/1995-97	-0.214	-0.205	-0.067	-0.012	0.070
	1995-97/2001-03	-0.040	0.000	-0.068	-0.032	0.060
Kerala	1985-87/1995-97	-0.216	-0.234	-0.107	0.085	0.040
	1995-97/2001-03	-0.051	-0.076	-0.021	0.046	-0.000
Madhya Pradesh	1985-87/1995-97	-0.133	-0.117	0.008	-0.032	0.008
	1995-97/2001-03	-0.056	0.025	-0.067	-0.052	0.038
Maharashtra	1985-87/1995-97	-0.197	-0.140	-0.027	-0.011	-0.019
	1995-97/2001-03	-0.198	-0.163	-0.036	-0.051	0.053
Orissa	1985-87/1995-97	-0.138	-0.118	-0.023	-0.023	0.026
	1995-97/2001-03	-0.158	-0.087	-0.074	-0.055	0.058
Punjab	1985-87/1995-97	-0.130	-0.112	-0.056	0.006	0.031
	1995-97/2001-03	-0.153	0.054	-0.223	-0.033	0.049
Rajasthan	1985-87/1995-97	-0.118	-0.144	0.014	-0.029	0.041
	1995-97/2001-03	-0.067	-0.033	-0.033	-0.052	0.051
Tamil Nadu	1985-87/1995-97	-0.197	-0.227	-0.009	0.002	0.037
	1995-97/2001-03	-0.048	0.076	-0.123	-0.020	0.020
Uttar Pradesh	1985-87/1995-97	-0.104	-0.090	0.035	-0.051	0.002
	1995-97/2001-03	-0.077	0.033	-0.067	-0.091	0.048
West Bengal	1985-87/1995-97	-0.283	-0.313	-0.036	0.024	0.043
	1995-97/2001-03	-0.115	-0.032	-0.119	-0.039	0.074

Source: Author's calculations.

Table 7	Contribution of change in *AMFR*, *GMFR*/*AMFR*, *GFR*/*GMFR*, and *CBR*/*GFR* to change in CBR - Urban Population.					
Country/State	Period	*Index of change*				
		r_b	r_g	r_a	r_m	r_p
India	1985-87/1995-97	-0.227	-0.196	-0.071	-0.012	0.051
	1995-97/2001-03	-0.091	0.008	-0.097	-0.042	0.041
Andhra Pradesh	1985-87/1995-97	-0.314	-0.292	-0.078	0.012	0.044
	1995-97/2001-03	-0.096	0.037	-0.134	-0.044	0.044
Assam	1985-87/1995-97	-0.178	-0.196	-0.079	0.105	-0.008
	1995-97/2001-03	-0.141	-0.107	-0.097	-0.014	0.077
Bihar	1985-87/1995-97	-0.248	-0.225	-0.043	-0.045	0.065
	1995-97/2001-03	-0.010	-0.014	0.013	-0.030	0.022
Gujarat	1985-87/1995-97	-0.268	-0.256	-0.052	-0.054	0.094
	1995-97/2001-03	-0.106	-0.102	-0.028	-0.015	0.040
Haryana	1985-87/1995-97	-0.247	-0.147	-0.143	-0.011	0.054
	1995-97/2001-03	-0.078	-0.023	-0.084	-0.019	0.048
Karnataka	1985-87/1995-97	-0.238	-0.192	-0.125	-0.003	0.081
	1995-97/2001-03	-0.103	-0.008	-0.110	-0.019	0.035
Kerala	1985-87/1995-97	-0.260	-0.127	-0.242	0.062	0.046
	1995-97/2001-03	-0.086	-0.074	-0.044	0.044	-0.011
Madhya Pradesh	1985-87/1995-97	-0.305	-0.226	-0.097	-0.051	0.068
	1995-97/2001-03	-0.025	0.069	-0.091	-0.055	0.053
Maharashtra	1985-87/1995-97	-0.238	-0.177	-0.076	-0.015	0.030
	1995-97/2001-03	-0.081	0.000	-0.089	-0.035	0.043
Orissa	1985-87/1995-97	-0.224	-0.171	-0.081	-0.047	0.075
	1995-97/2001-03	-0.096	0.067	-0.184	-0.040	0.061
Punjab	1985-87/1995-97	-0.344	-0.227	-0.144	-0.014	0.040
	1995-97/2001-03	-0.074	0.176	-0.262	-0.064	0.075
Rajasthan	1985-87/1995-97	-0.194	-0.207	-0.016	-0.033	0.062
	1995-97/2001-03	-0.051	-0.059	-0.025	-0.024	0.058
Tamil Nadu	1985-87/1995-97	-0.237	-0.196	-0.108	0.005	0.062
	1995-97/2001-03	-0.057	0.070	-0.136	-0.004	0.013
Uttar Pradesh	1985-87/1995-97	-0.108	-0.081	-0.001	-0.039	0.014
	1995-97/2001-03	-0.052	0.024	-0.059	-0.068	0.051
West Bengal	1985-87/1995-97	-0.233	-0.257	-0.071	0.022	0.073
	1995-97/2001-03	-0.150	-0.009	-0.171	-0.018	0.048

Source: Author's calculations.

Table 8: Average annual rate of change in age-specific marital fertility rates in India: 1995-97 through 2001-03.

Country/State	Age group						
	15-19	20-24	25-29	30-34	35-39	40-44	45-49
				Total Population			
India	0.021	0.012	-0.005	-0.028	-0.028	-0.061	-0.052
Andhra Pradesh	0.027	0.016	-0.025	-0.092	-0.102	-0.172	-0.018
Assam	0.024	0.010	-0.002	-0.036	-0.021	-0.054	-0.123
Bihar	0.041	0.023	0.005	-0.013	-0.011	-0.027	-0.022
Gujarat	0.035	-0.015	-0.001	-0.021	-0.039	-0.042	-0.043
Haryana	0.037	0.009	-0.021	-0.042	-0.045	-0.093	-0.029
Karnataka	0.023	0.010	-0.010	-0.017	-0.130	-0.069	-0.100
Kerala	-0.036	-0.002	0.002	-0.003	0.006	-0.021	-0.274
Madhya Pradesh	0.015	0.022	0.012	-0.028	-0.025	-0.066	-0.015
Maharashtra	-0.019	-0.007	-0.024	-0.056	-0.045	-0.051	-0.048
Orissa	-0.003	-0.005	-0.008	-0.029	-0.032	-0.110	-0.040
Punjab	0.055	0.007	-0.003	-0.056	-0.096	-0.183	-0.136
Rajasthan	0.019	0.021	-0.013	-0.028	-0.049	-0.048	-0.057
Tamil Nadu	0.027	0.010	0.011	-0.003	-0.001	-0.036	-0.054
Uttar Pradesh	0.042	0.026	-0.001	-0.016	-0.005	-0.040	-0.047
West Bengal	0.023	0.001	-0.013	-0.031	-0.062	-0.082	-0.067
				Rural Population			
India	0.024	0.015	-0.007	-0.031	-0.029	-0.058	-0.051
Andhra Pradesh	0.028	0.017	-0.032	-0.108	0.146	-0.165	-0.062
Assam	0.027	0.011	0.000	-0.036	-0.021	-0.054	-0.127
Bihar	0.045	0.025	0.005	-0.013	-0.013	-0.030	-0.025
Gujarat	0.043	0.016	0.007	-0.019	-0.045	-0.031	-0.049
Haryana	0.037	0.009	-0.020	-0.048	-0.040	-0.093	-0.031
Karnataka	0.025	0.038	-0.015	-0.023	-0.139	-0.079	-0.064
Kerala	-0.035	-0.001	0.004	0.002	0.004	0.005	-0.023
Madhya Pradesh	0.017	0.002	0.010	-0.023	-0.063	-0.005	-0.012
Maharashtra	-0.029	-0.010	-0.041	-0.073	-0.058	-0.052	-0.050
Orissa	-0.006	-0.007	-0.007	-0.031	-0.032	-0.113	-0.042
Punjab	0.051	0.006	-0.011	-0.072	-0.111	-0.184	-0.136
Rajasthan	0.025	0.047	-0.016	-0.031	-0.050	-0.050	-0.048
Tamil Nadu	0.024	0.010	0.007	-0.004	0.011	-0.030	-0.117
Uttar Pradesh	0.047	0.027	-0.001	-0.016	-0.007	-0.034	-0.051
West Bengal	0.026	0.003	-0.015	-0.038	-0.068	-0.078	-0.037

Country/State	Age group						
	15-19	20-24	25-29	30-34	35-39	40-44	45-49
	Urban Population						
India	-0.001	0.003	0.007	-0.010	-0.012	-0.053	-0.021
Andhra Pradesh	0.020	0.012	-0.006	-0.045	-0.005	-0.190	0.220
Assam	-0.043	-0.001	-0.012	-0.048	-0.063	-0.063	-0.127
Bihar	0.020	0.002	0.008	-0.002	0.022	0.027	0.045
Gujarat	0.003	-0.017	-0.020	-0.029	-0.026	-0.089	-0.022
Haryana	0.036	0.007	-0.025	-0.020	-0.076	0.112	0.030
Karnataka	0.016	-0.008	0.002	-0.003	-0.105	0.008	-0.243
Kerala	-0.035	-0.008	-0.006	-0.013	0.010	-0.138	-0.122
Madhya Pradesh	0.018	0.028	-0.006	-0.015	-0.019	-0.010	0.000
Maharashtra	0.012	-0.001	0.000	-0.031	-0.020	-0.052	-0.076
Orissa	0.034	0.013	-0.009	-0.014	-0.040	0.048	0.103
Punjab	0.079	0.003	0.024	-0.005	-0.046	-0.177	-0.133
Rajasthan	-0.029	0.005	-0.001	-0.019	-0.078	-0.006	-0.174
Tamil Nadu	0.037	0.009	0.020	-0.005	-0.022	-0.030	0.000
Uttar Pradesh	0.008	0.018	0.002	-0.013	0.010	-0.075	-0.008
West Bengal	0.008	-0.010	-0.009	-0.010	-0.055	-0.110	-0.301

Source: Author's calculations

Table 9: Cumulative distribution of fertility of married women by age in India: 1995-97.

Country/State	Age group						
	15-19	20-24	25-29	30-34	35-39	40-44	45-49
				Total Population			
India	22.02	54.23	76.17	88.97	95.48	98.83	100.00
Andhra Pradesh	37.12	73.49	90.01	96.55	98.94	99.83	100.00
Assam	30.56	58.50	77.40	90.21	96.33	99.27	100.00
Bihar	13.98	40.90	64.10	81.85	92.29	98.13	100.00
Gujarat	14.81	52.59	79.39	91.94	97.36	99.43	100.00
Haryana	21.28	58.99	82.86	92.78	97.19	99.37	100.00
Karnataka	29.92	66.55	86.57	93.83	98.52	99.71	100.00
Kerala	33.43	69.34	90.12	97.66	99.51	99.84	100.00
Madhya Pradesh	23.07	54.28	76.11	89.06	95.72	99.06	100.00
Maharashtra	26.22	66.24	87.28	95.79	98.64	99.65	100.00
Orissa	25.41	56.81	79.09	91.37	96.98	99.51	100.00
Punjab	22.60	61.67	85.33	95.05	98.58	99.73	100.00
Rajasthan	14.39	45.81	70.33	85.37	93.92	98.22	100.00
Tamil Nadu	33.62	71.62	90.54	97.45	99.42	99.86	100.00
Uttar Pradesh	13.60	39.72	63.22	80.89	91.43	97.45	100.00
West Bengal	31.77	64.43	83.26	92.83	97.17	99.37	100.00
				Rural Population			
India	20.79	51.89	73.91	87.60	94.83	98.66	100.00
Andhra Pradesh	36.88	72.98	89.42	96.23	98.87	99.79	100.00
Assam	29.80	57.30	76.28	89.61	96.04	99.21	100.00
Bihar	13.47	39.76	62.90	81.04	91.91	98.04	100.00
Gujarat	14.24	50.49	77.30	90.71	97.00	99.37	100.00
Haryana	20.69	58.03	81.70	92.00	96.80	99.27	100.00
Karnataka	30.11	64.30	85.31	92.93	98.29	99.72	100.00
Kerala	32.09	68.81	90.13	97.63	99.49	99.84	100.00
Madhya Pradesh	22.21	52.66	74.50	87.97	95.17	98.96	100.00
Maharashtra	24.81	65.32	86.43	95.32	98.47	99.60	100.00
Orissa	24.93	56.04	78.22	90.90	96.78	99.46	100.00
Punjab	22.29	60.52	84.50	94.68	98.44	99.73	100.00
Rajasthan	14.05	42.35	67.43	83.71	93.12	98.04	100.00
Tamil Nadu	32.91	70.73	90.13	97.18	99.35	99.83	100.00
Uttar Pradesh	12.97	38.37	61.78	79.96	90.96	97.26	100.00
West Bengal	30.28	62.66	81.54	91.78	96.62	99.28	100.00

Country/State	Age group						
	15-19	20-24	25-29	30-34	35-39	40-44	45-49
	Urban Population						
India	27.74	63.33	84.48	94.00	97.87	99.49	100.00
Andhra Pradesh	37.89	75.06	91.79	97.59	99.21	99.96	100.00
Assam	39.05	69.77	87.13	95.51	98.98	99.86	100.00
Bihar	20.58	53.28	75.97	89.45	95.92	99.06	100.00
Gujarat	16.11	57.20	83.82	94.58	98.23	99.58	100.00
Haryana	24.80	62.68	86.82	95.37	98.48	99.71	100.00
Karnataka	32.01	68.81	88.26	95.33	98.92	99.64	100.00
Kerala	38.97	71.71	90.48	97.80	99.57	99.84	100.00
Madhya Pradesh	28.26	63.49	85.26	95.03	98.73	99.69	100.00
Maharashtra	29.80	68.13	88.74	96.61	98.92	99.75	100.00
Orissa	29.98	63.12	85.80	94.97	98.65	99.92	100.00
Punjab	22.20	64.64	87.61	96.07	98.98	99.71	100.00
Rajasthan	18.84	55.24	80.40	91.51	97.14	98.99	100.00
Tamil Nadu	35.51	73.55	91.42	98.05	99.56	99.95	100.00
Uttar Pradesh	18.61	48.28	71.51	86.15	94.08	98.59	100.00
West Bengal	37.26	69.31	87.75	95.46	98.56	99.63	100.00

Source: Author's calculations

Table 10:	Contraceptive prevalence rate in India and states, 1992-93; 1998-99; 2002-04.											
Country/	2002-04				1998-99				1992-93			
State	Traditional methods	Spacing methods	Terminal methods	All methods	Traditional methods	Spacing methods	Terminal methods	All methods	Traditional methods	Spacing methods	Terminal methods	All methods
India	7.3	10.2	35.2	52.7	6.2	7.4	35.0	48.6	4.3	5.5	30.9	40.7
Andhra Pradesh	0.3	1.1	61.3	62.7	0.1	1.0	57.7	58.8	0.5	1.8	44.7	47.0
Assam	28.7	15.7	12.9	57.3	11.9	14.9	13.4	40.2	22.9	5.4	14.4	42.7
Bihar	3.7	4.7	22.3	30.7	1.4	2.2	21.2	24.8	1.5	2.9	18.6	23.0
Gujarat	6.9	11.8	40.6	59.3	6.4	9.4	42.6	58.4	2.4	5.8	41.0	49.2
Haryana	6.0	17.6	36.5	60.1	5.5	13.3	39.3	58.1	5.3	9.6	34.7	49.6
Karnataka	1.6	5.1	52.6	59.3	1.5	5.1	52.9	59.5	1.8	4.8	42.5	49.1
Kerala	13.9	7.6	46.9	68.4	10.5	7.4	50.2	68.1	8.9	6.1	48.3	63.3
Madhya Pradesh	3.1	8.8	38.3	50.2	2.1	4.4	37.9	44.4	1.0	4.0	31.5	36.5
Maharashtra	2.4	10.3	50.3	63.0	2.3	7.6	50.6	60.5	1.2	6.4	46.2	53.8
Orissa	12.8	12.0	29.4	54.2	9.8	5.4	33.9	49.1	1.6	3.0	31.6	36.2
Punjab	11.1	25.7	31.3	68.1	11.6	22.6	30.9	65.1	7.4	17.4	34.0	58.8
Rajasthan	4.5	10.5	31.8	46.8	1.4	6.5	32.4	40.3	0.9	3.2	27.7	31.8
Tamil Nadu	2.7	5.2	49.7	57.6	1.7	4.5	45.4	51.6	4.6	5.7	39.5	49.8
Uttar Pradesh	9.4	11.4	14.6	35.4	8.0	7.3	14.0	29.3	1.3	5.3	13.1	19.7
West Bengal	23.0	18.2	32.1	73.3	23.8	13.2	31.9	68.9	20.1	6.7	30.6	57.4

Sources National Family Health Survey 1992-993
District Level Household Survey 1998-99
District Level Household Survey 2002-04