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Abstract

Using the most recent information available through the District Level Household Survey 2006-07, the present paper analysis fertility transition at the district level on the basis of a fertility transition index. The analysis reveals that, in India, more than more than 54 per cent of the most recent births reported during DLHS 2007-08 were 'undesired' or 'excess' births which suggests that India is still to a long way in achieving the goal of population stabilisation as stipulated in the National Population Policy 2000. The analysis suggests that there are only 26 districts in the country which have reached an advanced stage of fertility transition while majority of the districts are either in the early or in the middle stages of fertility transition. The paper stresses the need of monitoring the implementation of fertility reduction and population stabilisation programme on the two dimensional space comprising of the dimension of birth planning and the dimension of birth limitation and argues that the fertility transition index may be used for the purpose. The paper also suggests that appropriate modifications may be made in the health management information system under the National Rural Health Mission, in this regard.

Key Words

India, fertility, fertility transition, fertility transition index, numerator-based indicators.

1 Introduction

Analysis of fertility transition at the district level is not a regular feature in India because there is no institutional mechanism that provides the information necessary to estimate fertility at the district level. The only source of information necessary for estimating fertility at district and below district level is the civil registration system. Although the registration of births in India is compulsory by the Registration of Birth and Death Act of 1967, yet, the gross under registration of births in the civil registration system is well known. At the national and state level, annual estimates of different indicators of fertility are generated through the sample registration system but at the district level and below the district level, no such system exists. As such, all district level estimates of fertility in India are prepared through the application of indirect techniques and use the information available through the population census which is conducted at an interval of 10 years (Government of India 1987; 1997, Mari Bhat 1996; Guilmoto and Rajan 2002). These estimates are generally available 5-7 years after the population census and, therefore, are of academic interest only. They are of very limited use in planning, implementing and monitoring and evaluating fertility reduction and population stabilisation programmes and activities. Similarly, the National Family Health Survey Programme, instituted in the early nineties, also does not provide district level estimates of fertility.

In order to improve the availability of population and health related information at the district level, the Government of India introduced the district level household survey under the Reproductive and Child Health Programme which was launched in the year 1996. The first district level household survey was conducted during the period 1998-99, the send during the period 2002-04 and the third, the latest one, during the period 2007-08. Although, these surveys have considerably improved the availability of population and health related information at the district level, yet they have not been designed to estimate fertility at the district level and, therefore, contribute little to district level analysis of transition in fertility to evaluate and measure the impact of fertility reduction and population stabilisation programmes and activities.

The need for analysing fertility transition at the district level also stems from the recent emphasis on decentralised district based approach towards population and development planning in the country. The National Population Policy 2000 as well as population policies of different states formulated around the year 2000 emphasise the need of a decentralised approach to address population and development related issues facing the people. Similarly, one of the goals of the National Rural Health Mission, launched in the year 2005, is the decentralisation of the public health care delivery system so as to effectively meet the diverse health and family welfare needs of the people. However, despite all emphasis on decentralisation, there have been little significant efforts towards evolving an information system that can meet the information needs of decentralised population and development planning and regularly monitor the transition in fertility at the district level.

In this paper, we develop a simple fertility transition index to analyse the transition in fertility at the district level on the basis of the information available from the District Level Household and Facility Survey (DLHS) 2007-08 (IIPS, 2010). The fertility transition index, developed and used in this paper, is based on the distribution of births reported during DLHS 2007-08 by the age of the woman and the order of the birth. Because of its simplicity, the fertility transition index developed and used in the present paper can be applied to measure and monitor fertility transition even a up to the village level by the grass roots level health and family welfare services providers and can be a part of the routine health and family welfare management information system.

The paper is organised as follows. The next section of the paper develops the fertility transition index and describes its rationale. The third section of the paper describes salient features of the data used in the analysis while the fourth section presents estimates of the fertility transition index and analyses transition in fertility at the district level as well as at the state and national level. The fifth section of the paper analyses the determinants of inter-district variation in the fertility transition index while the last section discusses policy and programme implications of the findings of the analysis. The appendix to the paper presents the estimates of fertility transition index for 601 districts of India for which information is available through DLHS 2007-08.

2 Measurement of Fertility

Fertility of a population can be measured in terms of either the intensity or the incidence of child bearing. The intensity of childbearing is measured in terms of exposure of a specific category of women to conception and child birth. Intensity is also termed as occurrence-exposure rate (Hoem and Hoem 1989) or the rate of the first kind (Calot 2002). Incidence, on the other hand, is measured in terms of exposure of all women in the age category. Incidence rates are also termed as frequencies or rates of the second kind or reduced rates. Intensity and incidence are however directly related and have relative advantages and disadvantages. The choice between the two depends upon their intrinsic properties and measurement issues. Fertility intensities are advocated on theoretical grounds. When they include all relevant dimensions of fertility, they can represent instantaneous probability that a woman in specific category gives birth (Hoem 1976). They are independent of the earlier child bearing behaviour of the mother. Incidence rates, on the other hand, does not reflect the risk of giving birth to any particular woman but have the additive property.

Estimation of the intensity or incidence of fertility requires information about occurrence of birth and population exposed to the risk of a birth. In India, estimates of the population exposed to the risk at the district and below district level is not available either through the civil registration system or through the statistics of the official family welfare programme and therefore estimation of the intensity or incidence of fertility is not possible. In such a situation, numerator analysis approach has been advocated for analysing patterns and transition in fertility(Ravenholt and Frederiksen 1968, Reynolds 1972, Chidambaram 1965, Balasubramanian 1972). Numerator analysis of fertility patterns and transition is based on the distribution of live births in a given period by the age and parity. The key concept in the numerator analysis is the concept of 'excess' or 'undesired' fertility. The 'excess' fertility is defined as the proportion of births falling in the 'excess' category. It may be defined either in terms of the age of the woman or in terms of parity or birth order. For example, Hamilton (1968) has defined "excess fertility" as all births to mothers under 15 or over 40 years of age, births above first parity for mothers aged 15-19 years, births above second parity for mothers 20-24 years, births above third parity for mothers 25-29 years, births above fourth parity for mothers 30-34 years, and births above fifth parity for mothers aged 35-39 years in the context of analysing fertility transition in United States of America. This approach is particularly important in the context of fertility transition as there are broadly two dimensions of fertility transition - the dimension of birth limitation and the dimension of birth planning. The dimension of birth planning is related to the increase in the age of woman at the first birth and proper spacing between successive births. This dimension of fertility transition is important in the context of population stabilisation. It is well known that even the replacement fertility (total fertility rate of 2.1) is achieved, the population continues to increase because of the in-built momentum in the population (Frejka 1982, Keyfitz 1971,

Merrick 1982). The effect of the population momentum can be minimised either by lowering average fertility of a woman further or by increasing the mean age at child bearing. Theoretically, the average fertility of a woman can be decreased to a level at which birth rate is equal to the death rate. This, however, implies that many couples will have only one child (Bongaarts 1994). At the same time, the dimension of birth planning is also important in the context of maternal and child health and survival. It is well known that it is the birth planning, not the birth limitation, which has the major impact on infant, child and maternal mortality as well as on the health of the health of the mother and the child. Obviously, transition in fertility should be measured and monitored in both the dimensions of fertility - the dimension of birth limitation and the dimension of birth planning. However, conventional measures of fertility such as the total fertility rate does not take into account the dimension of birth planning. The fertility index that we develop and use in this paper takes into consideration both the dimensions of fertility transition.

The total number of live births reported during a given year or any reference period may be distributed by the age of the woman and the order of the birth in the following manner:

Age of woman	Birth order		
	1-2	>=3	Total
15-19 years	B_{11}	B_{12}	$B_{1.}$
20-49 years	B_{21}	B_{22}	$B_{2.}$
Total	$B_{.1}$	$B_{.2}$	$B_{..}$

It is clear from the above table that

$$B_{..} = B_{11} + B_{12} + B_{21} + B_{22}$$

or

$$B_{21} = B_{..} - (B_{11} + B_{12} + B_{22})$$

$$B_{21} = B_{..} - ((B_{11}+B_{12}) + (B_{12}+B_{22}) - B_{12})$$

or

$$B_{21}/B_{..} = 1 - [(B_{1.}/B_{..}) + (B_{.2}/B_{..}) - (B_{12}/B_{..})]$$

or

$$b_{21} = 1 - b_{1.} + b_{.2} - b_{12} \qquad (1)$$

where

b_{21} = proportion of births to women aged 20-49 years and birth order less than 3.

$b_{1.}$ = proportion of births to women aged 15-19 years

$b_{.2}$ = proportion of 3rd and higher order births

b_{12} = proportion of 3rd and higher order births to women aged 15-19 years.

Equation (1) suggests that the proportion of births to women aged 20-49 years and birth order less than 3 (b_{21}) may be taken as an indicator of transition in fertility. When this proportion is equal to one, all births in a given year or during a reference period are 1st and 2nd order births and confined to women aged at least 20 years. Obviously, this proportion takes into consideration both the dimension of birth limitation, captured through the proportion of 1st and 2nd order births, and dimension of birth planning, captured through the proportion of births to women aged at least 20 years.

On the basis of the foregoing discussions, we define the fertility transition index (FTI) as

$$FTI = 1 - (b_{1.} + b_{.2}) \quad (2)$$

It is clear that when the proportion of births to women aged less than 20 years ($b_{1.}$) and the proportion of 3rd and higher order births ($b_{.2}$) are zero, FTI = 1. On the other hand when all births in a year or during a specific period are 3rd and higher order births confined to women less than 20 years of age, FTI = 0.

Notice that (2) can also be written as

$$FTI = 1 - (b_{11} + b_{12} + b_{.2}) \quad (3)$$

Here, the proportion of 1st and 2nd order births to women less than 20 years of age (b_{11}) captures the delay in the first birth and spacing between marriage and 1st birth as well as the spacing between 1st and 2nd births. The smaller is this proportion, the higher is the age at first birth and large is the birth interval. Similarly, the proportion of 3rd and higher order births to women aged less than 20 years of age captures the spacing between successive births. The smaller is this proportion the larger is the interval between successive births. Finally, the proportion of 3rd and higher order births captures birth limitation. In this way, the FTI defined by (3) or equivalently by (2) captures both the dimensions of fertility transition.

The FTI defined by equation (2) is based on two indicators - proportion of 3rd and higher order births and the proportion of births to women aged less than 20 years. The progression from second to third birth is argued to be a crucial component of fertility change (United Nations 1997) and a decline in fertility would be reflected by a decrease in the proportion of 3rd or higher order births. The reason is that in situations where women would tend to limit their family size, and higher order births would become more infrequent. These expectations have been borne out in a number of studies (Prasartakul et al. 1987, Srinivasan et al. 1992, Singh 2002). Singh has shown that the proportion of 3rd and higher order births is linearly related to the total fertility rate across the states of India.

On the other hand, proportion of births to women aged less than 20 years is relevant in view of the fact that fertility decline proceeds in two stages. The first stage of fertility decline is due to rising age at marriage and the age at first birth (Westoff 1992). The second stage involves the adoption of contraception and a change in fertility within marriage. It has been observed that the latter is the age at first birth, the lower is the fertility (Sivakumar, 2000) and a decreasing proportion of births to women aged less than 20 years may be taken as an indicator of the rising age at first birth. A decreasing proportion of births to women aged less than 20 years is also a reflection of increasing interval between births.

The fertility transition index (FTI) defined above is particularly useful in monitoring the impact of fertility regulation programmes and interventions (Bertrand, Magnani and Knowles, 1994). India's National Population Policy 2000 calls for both reducing the average number of children per woman by limiting births as well as delay in child bearing through the increase in the age at marriage and at first birth as well as through increase in the interval between births (Government of India 2000). The progress towards birth limitation is captured through the proportion of 3rd and higher order births while the progress towards the increase in the age at marriage and age at first birth and the increase in the birth interval is captured through the proportion of birth to women aged less than 20 years. Thus FTI takes into consideration the dimension of birth limitation as well as the dimension of birth planning.

There are many advantage of FTI defined above in measuring and monitoring fertility transition. First and the foremost, it takes into consideration both the dimensions of fertility transition - the dimension of birth planning and the dimension of birth limitation. This is important as programmes and activities directed towards fertility reduction and population stabilisation are directed towards both the dimension of birth limitation and the dimension of birth planning.

The second advantage of FTI is its simplicity and straightforward approach of calculation. FTI requires information about births during the reference period by the age of the woman and the order of the birth only. This information is routinely recorded in the health care delivery institutions so that FTI can be estimated at the local level by the grass root level health and family welfare services providers or even by the community. FTI can also be calculated on the basis of registered births even in situations where the registration of births is incomplete if it is assumed that there is no bias in reporting and registering of births by the age of the woman or the order of the birth.

The official fertility regulation efforts in India have traditionally been focussed on the dimension of birth limitation only. Transition in this dimension can be measured and monitored in terms of the proportion of 3rd and higher order births which has also been found to be directly related to the total fertility rate, the most popular indicator of fertility (Mari Bhat, 2004; Singh, 2002; Tyagi, 2002). The second dimension of fertility transition - the dimension of birth planning - always received a residual attention in the implementation of fertility reduction and population stabilisation efforts, although, the importance of birth planning has always been emphasised at the policy level. One indicator of a residual attention given to birth planning is that there has never been a sincere attempt to measure and monitor birth planning. The conventional approach of monitoring the performance of fertility regulation efforts does not take into consideration the birth planning dimension of fertility transition. In this context, the fertility transition index (FTI) defined above takes into consideration both the dimensions of fertility transition. The index can therefore be useful to population policy makers and family planning programme managers in monitoring the progress towards population stabilisation. In this context, the FTI is a better indicator for measuring and monitoring population stabilisation than the conventional indicator like the total fertility rate.

3. Data Source

We use information available through the latest district level household survey (DLHS 2007-08). DLHS 2007-08 was carried out throughout the country and covered around 0.7 million households in 611 districts to facilitate effective monitoring of health and family welfare programmes at the district level (IIPS, 2010). The focus of DLHS 2007-08 is to provide health care and utilization indicators at the district level for the enhancement of the activities under the National Rural Health Mission (NRHM) which was launched by the Government of India in 2005 and which aims at architectural corrections in the health care delivery system to effectively meet the health needs of the people (Government of India, 2005). The survey covered around 1000-1500 households in each district. The households surveyed were selected through a stratified random sampling procedure. The sample included, wherever possible, both rural and urban areas within the district.

During the DLHS 2007-08, information about all births during the period (1 January 2004 to the survey date) was collected from all currently married females in the reproductive age group included in the sample. The date of the survey varied from state to state and from district to districts but the entire field work in all states and all districts were carried out during the period 2007-08. For each reported birth during the survey, information about the age of the woman at the time of the birth and the order of birth was collected. This information constituted the basis for the present analysis. DLHS 2007-08 provides information about the age of woman at the time of birth and the birth order for 215962 most recent births which were reported during the survey. If a currently married woman in the reproductive age group reported more than one birth during the reference period of the survey, then information related to the most recent birth only has been used.

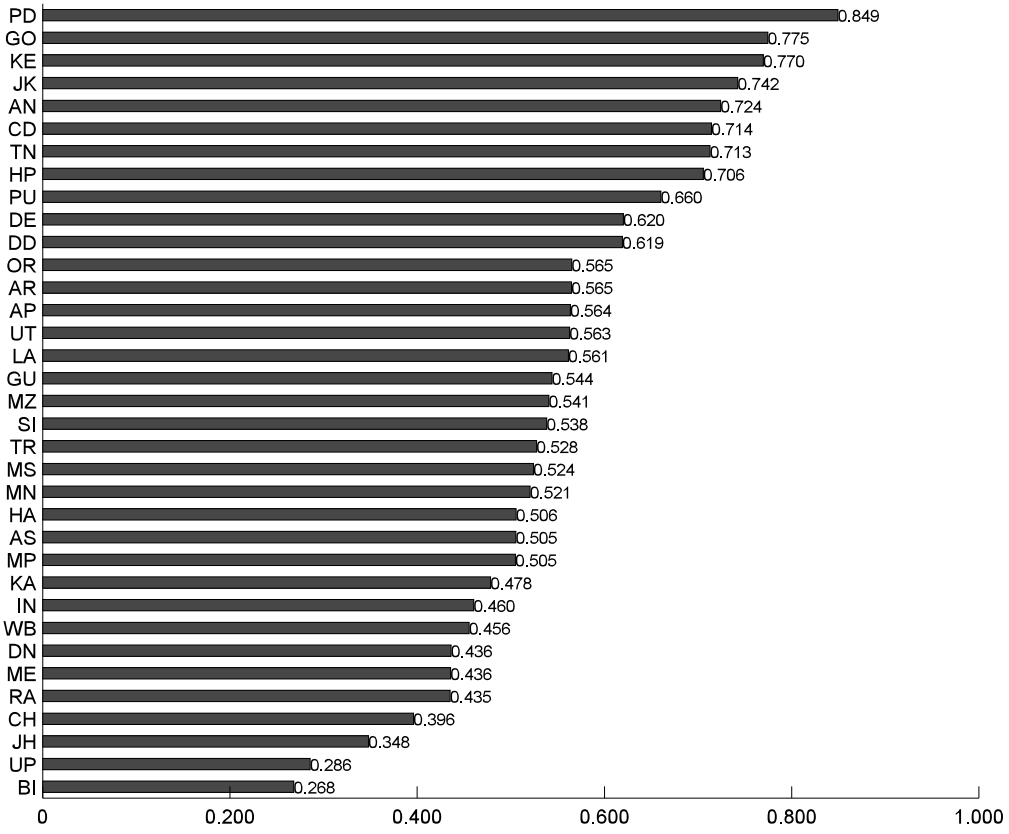
4 Fertility Transition in India

Country Scenario. According to DLHS 2007-08, around 41 per cent of the births reported during the reference period of the survey was 3rd and higher order births whereas the proportion of births to women aged less than 20 years was around 13 per cent (Figure 1). This implies that the FTI in India was around 0.460 during the period 2007-08. These observations present rather bleak picture of fertility transition in the second most populous country of the world which is slated to become the post populous country by the year 2040. It is also obvious that despite all official efforts to promote small family norm, the progress in limiting the number of births has at best lethargic. At the same time, a more serious concern is that, with the decrease in fertility, there has been a very rapid increase in the proportion of births to women aged less than 20 years indicating that concerns related to early child bearing and proper spacing between successive births have largely remained unattended in the quest towards population stabilisation. This means that the current approach of fertility regulation and population stabilisation in India has paid little attention to the issue of population momentum that is going to be a dominant force in the future population growth. This also means that official fertility regulation efforts are hardly directed towards improving the health status of women and children.

State Scenario. There is wide diversity in fertility transition across different states/Union Territories of the country as reflected through the FTI. The index has been estimated to be the highest in Puducherry which was the only state/Union Territory of the country with an FTI of almost 0.85 indicating that fertility transition in Puducherry is almost complete. In addition, in seven states/ Union Territories of the country - Goa, Kerala, Jammu and Kashmir, Andman and Nikobar, Chandigarh, Tamil Nadu and Himachal Pradesh - the FTI has been estimated to be more than 0.70 suggesting that fertility transition in these states/Union Territories is fairly advanced. On the other hand, the FTI has been estimated to be the lowest in Bihar (0.268) followed by Uttar Pradesh (0.286). Bihar and Uttar Pradesh are the only two states and Union Territories in the country where the FTI has been estimated to be less than 0.30 which suggests these states are at a very early stage of fertility transition. Other states/Union Territories where fertility transition is at its early stage Jharkhand, Chhattisgarh, Rajasthan, Meghalaya, Dadra and Nagar Haveli, West Bengal and Karnataka. In all this states, the FTI has been estimated to be less than 0.70. In the remaining states/Union Territories, the FTI ranges between 0.50 and 0.70 indicating some transition in fertility.

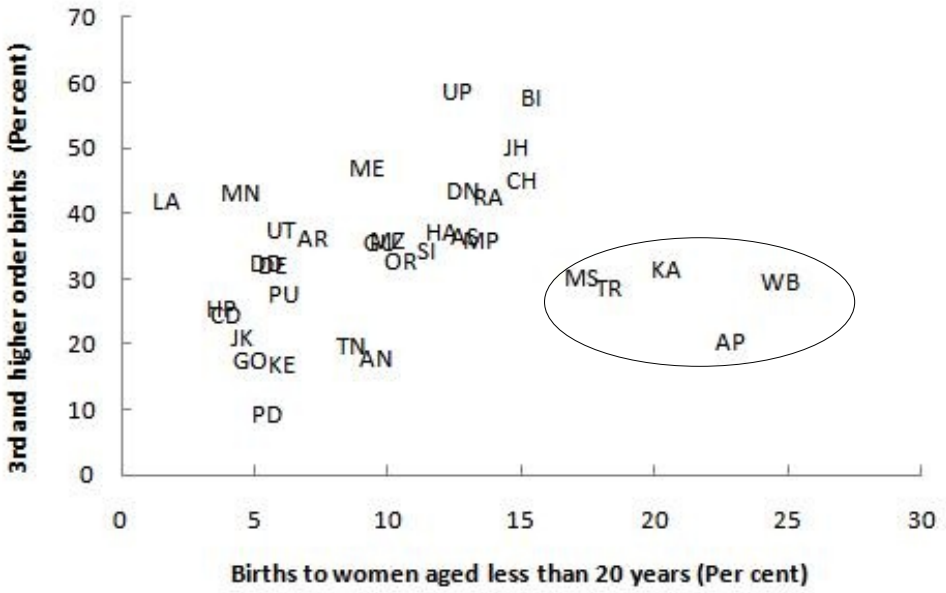
In figure 2, we have mapped the states/Union Territories on the two dimensions of fertility transition - the dimension of birth limitation (measured in terms of the proportion of 3rd and higher order births) and the dimension of birth planning (measured in terms of the proportion of births to women aged less than 20 years). There are nine states/Union Territories - Lakshadweep, Manipur, Dadra & Nagar Haveli, Rajasthan, Meghalaya, Chhattisgarh, Jharkhand, Bihar and Uttar Pradesh - where the proportion of 3rd and higher order births was at least 40 per cent at DLHS 2007-08 but the proportion of births to women aged less than 20 years was less than 15 per cent. The FTI, in these states is the highest in the country. On the other hand, in six states/Union Territories - Jammu and Kashmir, Goa, Kerala, Tamil Nadu, Andaman and Nikobar and Puducherry - both the proportion of 3rd and higher order births and the proportion of births to women aged less than 20 years were very low. These are the states/Union Territories where the FTI is the highest in the country indicating that fertility transition is at an advanced stage in these states/Union Territories.

Figure 1
Fertility Transition Index (FTI) India and States/Union Territories, 2007-08



AN	Andaman & Nikobar	HA	Haryana	OR	Orissa
AP	Andhra Pradesh	HP	Himachal Pradesh	PD	Puducherry
AR	Arunachal Pradesh	JH	Jharkhand	PU	Punjab
AS	Assam	JK	Jammu & Kashmir	RA	Rajasthan
BI	Bihar	KA	Karnataka	SI	Sikkim
CD	Chandigarh	KE	Kerala	TN	Tamil Nadu
CH	Chhattisgarh	LA	Lakshadeep	TR	Tripura
DD	Daman & Dieu	ME	Meghalaya	UP	Uttar Pradesh
DE	Delhi	MN	Manipur	UT	Uttarakhand
DN	Dadra & Nagar Haveli	MP	Madhya Pradesh	WB	West Bengal
GO	Goa	MS	Maharashtra		
GU	Gujarat	MZ	Mizoram	IN	India

Figure 2
Location of states on the two dimensions of fertility transition



Finally, there are five states - Maharashtra, Tripura, Karnataka, West Bengal and Andhra Pradesh - where the proportion of 3rd and higher order births has been found to be very low but the proportion of births to women aged less than 20 years very high. In Andhra Pradesh, the proportion of 3rd and higher order births is estimated to be less than the proportion of births to women aged less than 20 years. Because of the very high proportion of births to women aged less than 20 years, the FTI is low in these states, although the total fertility rate, in these states, is well below the replacement level (Government of India 2010). These states are fairly advanced in the dimension of birth limitation but are lagging behind in the dimension of birth planning. It appears that, in these states, decrease in the 3rd and higher births has resulted in an increased concentration of births to women aged less than 20 years which not only suggests a very early age at first birth but also narrow birth intervals resulting in a low mean age at child bearing. This situation is not conducive to minimising the impact of population momentum on future population growth. All these states have achieved replacement fertility which means that the future population growth in these states will be the result of population momentum. In order to minimise the impact of population momentum on the future population growth in these states, it is imperative that the child bearing is spread over the reproductive life span and does not get concentrated in the younger age group as is the tendency in the absence of birth planning. To achieve this, it is necessary that: (1) the age at first birth is delayed either through increasing the age at marriage or through increasing the interval between marriage and the first birth, and (2) the interval between first and second birth is increased through the use of spacing methods of family planning.

District Scenario. The information available through DLHS 2007-08 permits to estimate the FTI at the district level. These estimates along with the proportion of births to women aged less than 20 years and the proportion of 3rd and higher order births are given in the appendix and the distribution of the districts by the level of FTI and by state is presented in figure 3. Information available through DLHS 2007-08 suggests that there are only 9 districts in the country which have an FTI of more than 0.900 with district Pulwama of Jammu & Kashmir leading the list with an FTI of 0.959. Out of these 9 districts 6 are in Jammu & Kashmir, 2 in Kerala and 1 in Puducherry. In these districts, nearly all the most recent births reported during DLHS 2007-08 were 1st and 2nd order births to women aged 20 years and above so that fertility transition in these districts may be characterised as almost complete.

By contrast, there are 6 districts in the country where the FTI was estimated to be less than 0.200. Out of these 6 districts, 3 are in Uttar Pradesh, 2 in Bihar and 1 in Haryana with district Budaun of Uttar Pradesh has the lowest FTI in the country. In these districts, very few most recent births reported during the DLHS 2007-08 were 1st and 2nd order births to women age 20 years and above which indicates that there is hardly any transition in fertility in these districts. In addition, in 165 districts of the country, the FTI has been estimated to range between 0.20 through 0.40 out of which 115 districts are located in only three states - Bihar, Uttar Pradesh and Jharkhand. There are some indications of fertility transition in these districts but it is very much obvious that whatever fertility transition is there in these districts, it is at a very early stage.

On the whole, in 172 (29 per cent) districts of the country, the FTI has been estimated to be less than 0.40 on the basis of DLHS 2007-08. In these districts, fertility transition appears to be extremely slow either because the proportion of 3rd and higher order births remain exceptionally high or because of high to very high proportion of births to women aged less than 20 years. Out of these 172 districts, 120 are located in only three states - Bihar (37), Jharkhand (16) and Uttar Pradesh (64). In Bihar, the FTI has been estimated to be less than 0.40 in all the 37 districts. In Uttar Pradesh, FTI was less than 0.40 in 96 per cent of the districts whereas this proportion was almost 73 per cent in Jharkhand. In rest of the states/Union Territories, the proportion of districts having an FTI less than 0.40 been found to be less than 40 per cent. On the other hand, in six states of the country - Arunachal Pradesh, Delhi, Himachal Pradesh, Kerala, Punjab and Tamil Nadu - there was no district where the FTI is estimated to be less than 0.40 on the basis of the information available through DLHS 2007-78. In very small states and Union Territories of the country also, there was no districts where the FTI is estimated to be less than 0.400 on the basis of DLHS 2007-08.

By contrast, in 188 (31 per cent) districts of the country, the FTI is estimated to be at least 0.60 which suggests that there is transition in both the dimensions of fertility in these districts. Most of these districts are located in Himachal Pradesh, Kerala, Tamil Nadu and Punjab. In Himachal Pradesh, the FTI has been estimated to be 0.60 and above in all the districts. In Kerala, the FTI is estimated to be 0.60 and above in 93 per cent of the districts whereas this proportion is 90 per cent in Tamil Nadu and 80 per cent in Punjab. On the other hand, there are six states where there is not a single district with an FTI of at least 0.60. These states are Bihar, Chhattisgarh, Jharkhand, Meghalaya, Rajasthan and Uttar Pradesh. In West Bengal, the FTI has been estimated to be 0.60 and above in only 10 per cent of the districts whereas in Haryana and Madhya Pradesh, this proportion is 20 per cent.

Figure 3
Distribution of districts by FTI

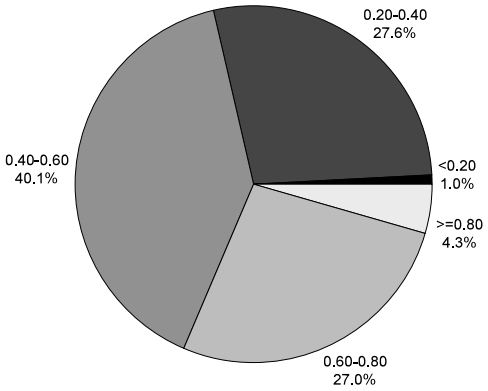


Figure 4
State wise distribution of districts by the level of FTI

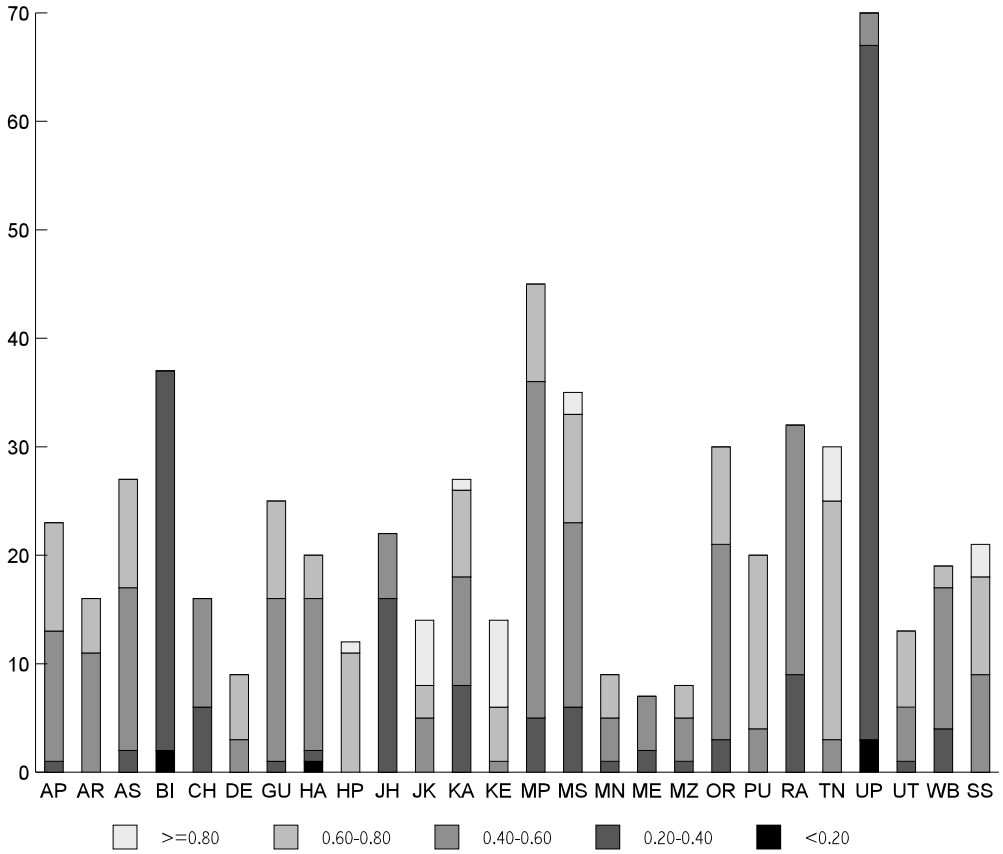
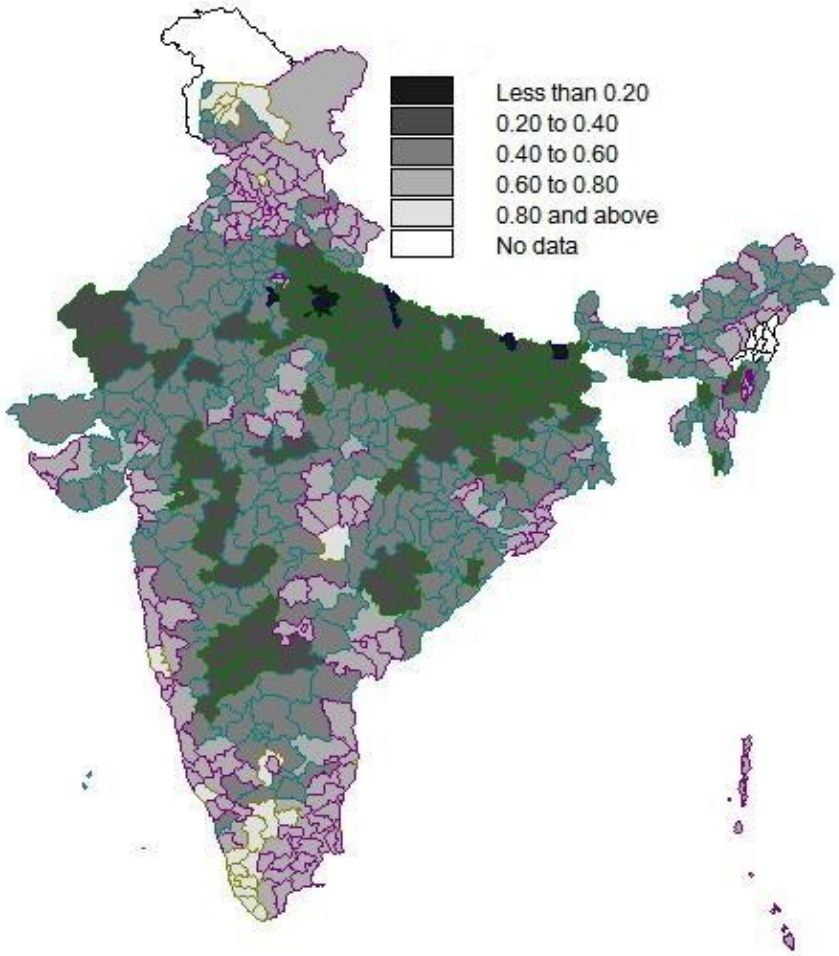
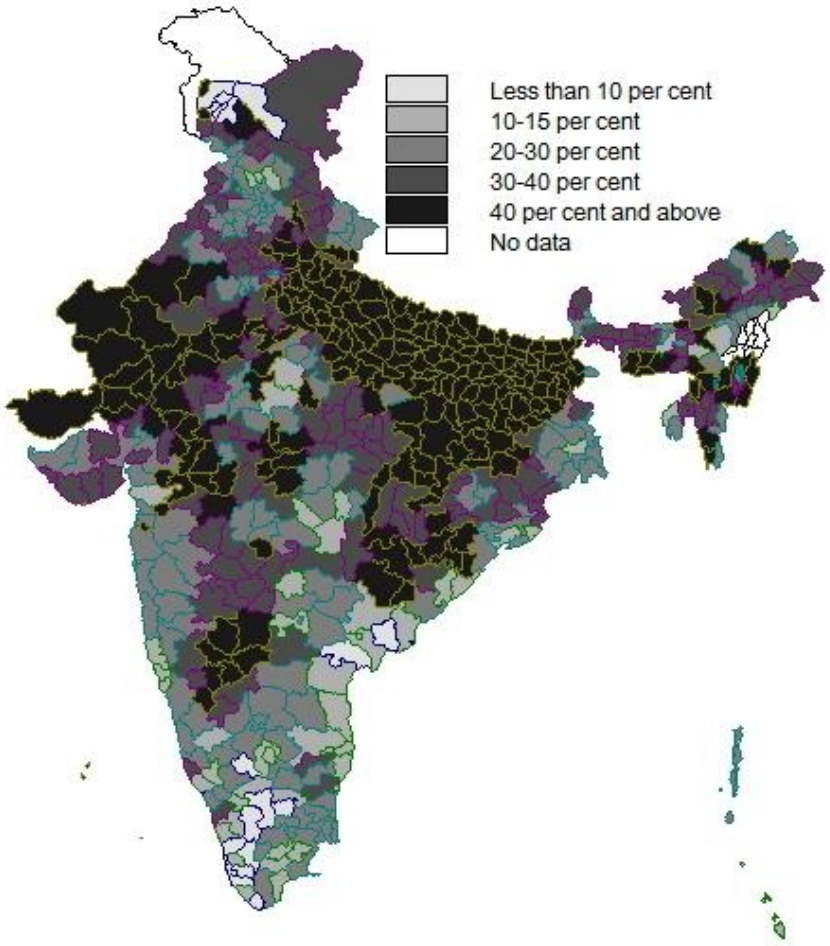


Figure 5
Fertility Transition Index (FTI) in districts of India, 2007



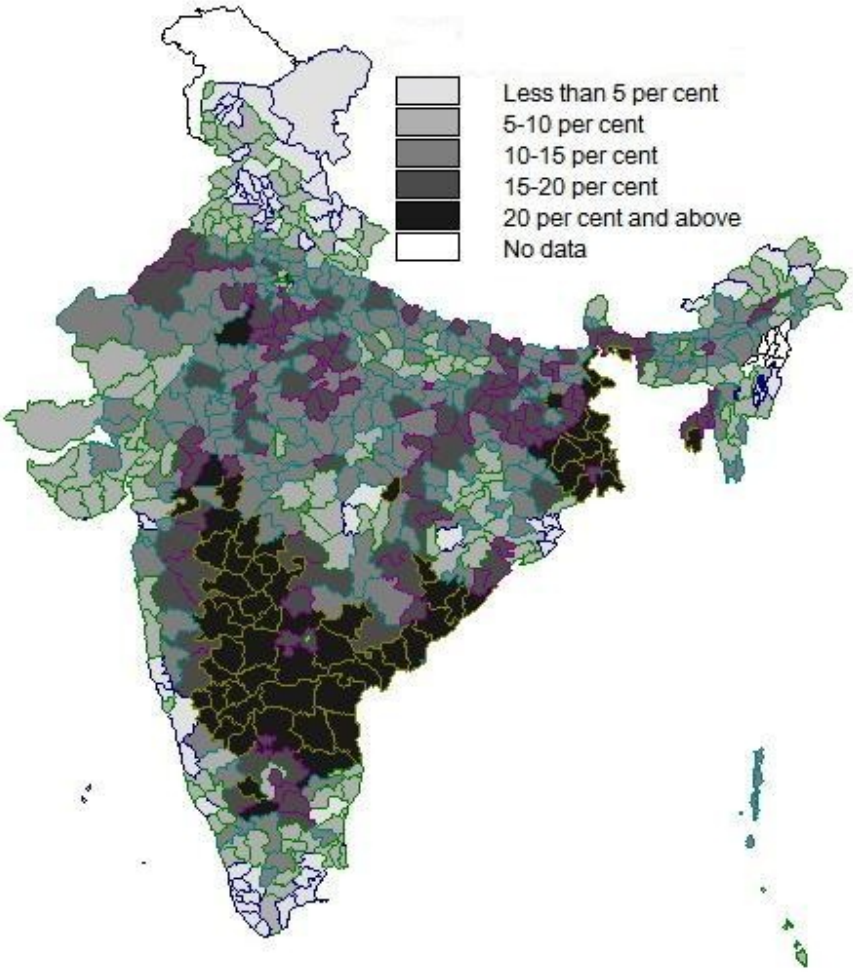
In table 4, we have classified districts by the proportion of 3rd and higher order births and by the proportion of births to women aged less than 20 years for the country as a whole as well as for different states/Union Territories. There are only 13 districts in the country where births to women aged less than 20 years is less than 5 per cent while the proportion of 3rd and higher order births is less than 10 per cent. This means that in these districts, more than three fourth of the most recent births reported at the DLHS 2007-08 were 1st and 2nd order births borne to women with at least 20 years of age. By contrast, in 17 districts of the country, the proportion of births to women aged less than 20 years is 20 per cent and more while the proportion of 3rd and higher order births is 40 per cent and more. In this districts, less than 40 per cent of the most recent births reported at the DLHS 2007-08 were 1st and 2nd order births borne to women with at least 20 years of age.

Figure 6
Proportion of 3rd and Higher order births in districts of India, 2007



It may also be seen from table 4 that there in 66 districts of the country, at least one fifth of the most recent births reported during DLHS 2007-08 were borne to women aged less than 20 years. Most of these districts are located in Maharashtra, Andhra pradesh, Karnataka and West Bengal. In West Bengal, this proportion has been estimated to be more than 20 per cent in 15 of the 19 districts. Similarly in 17 out of 23 districts in Andhra Pradesh, 14 out of 27 districts in Karnataka and 13 out of 35 districts in Maharashtra, this proportion has been estimated to be more than 20 per cent. In these districts, reduction in the 3rd and higher order births appears to have resulted in a concentration of births in women with very young age - age less than 20 years. This concentration of births in women of very young age is not a welcome feature of fertility transition. Because of the heavy concentration of births in women of very young age, the FTI in these districts is comparatively low despite the fact that the proportion of 3rd and higher order births is also very low in these districts. Fertility transition, in these districts is virtually confined to the dimension of birth limitation only.

Figure 7
Proportion of births to women aged less than 20 years in India, 2007



On the other hand, in 233 or almost 40 per cent districts of the country, 3rd and higher order births accounted for at least 40 per cent of the most recent births reported during DLHS 2007-08. Most of these districts are located in Bihar, Chhattisgarh, Jharkhand, Rajasthan, Uttar Pradesh. Out of 177 districts in these states, in 159 (almost 90 per cent) districts, the proportion of 3rd and higher order births accounted for at least 40 per cent of the most recent births reported during DLHS 2007-08. In all the 37 districts of Bihar, the proportion of 3rd and higher order births accounted for at least 40 per cent of the most recent births reported during DLHS 2007-08 whereas in 21 of the 22 districts in Jharkhand and 60 of the 70 districts in Uttar Pradesh, the proportion of 3rd and higher order births accounted for at least 40 per cent of the most recent births reported during DLHS 2007-08. At the same time, in six states of the country, there was no district where the proportion of 3rd and higher order births accounted for at least 40 per cent of the most recent births reported during DLHS 2007-08.

5 Determinants of Inter-district Variation in Fertility Transition

Inter-district variation in FTI can be explained in terms of a model of the family building process which may be viewed as a series of stages through women successively move from marriage to first birth, from first birth to second birth, and so on (United Nations, 1997). This model takes into consideration both the dimensions of fertility transition - the dimension of birth planning and the dimension of birth limitation - and therefore provides additional insight into the mechanisms underlying fertility transition, including impact of fertility regulation efforts (Feeny, 1983). This model has been found to be successful in presenting fertility transition in terms of its components: changes in the proportion of ever married women, changes in the female age at marriage, changes in the age at first birth and changes in birth intervals primarily through the use of contraceptive methods. DLHS 2007-08 provides district level estimates of the proportion of females married before 18 years of age out of the females marrying during the reference period (MAR) and the prevalence rate terminal methods (TER), modern spacing methods (SPA) and traditional methods (TRA) of contraception. DLHS 2007-08 also provides district level estimates of female literacy rate (FLT) and proportion of households with low standard of living index (LSL). We use this information to explain inter-district variation in FTI by regressing FTI on MAR, TER, SPA, TRA, FLT and LSL using the district level estimates available through DLHS 2007-08. We employ the stepwise regression approach. Stepwise regression helps in finding out the that subset of the independent variables in the regression model that best predicts the dependent variable - FTI - in the present case.

Results of the regression analysis are given in table 5 which suggest that inter-district variation in MAR, TER, LSL and FLT explained more than 61 per cent of the inter-district variation in FTI. Inter-district variation MAR alone accounted for more than 46 per cent of the inter-district variation in FLT. By contrast, LSL explained only about 9 per cent of this variation while TER and FLT, respectively, explained around 5 per cent and 2 per cent of the variation in FLT across the districts of India. Moreover, the regression coefficients of the four variables were found to be statistically significant and in expected direction. On the other hand, the regression coefficients of SPA - prevalence of modern spacing methods of contraception and TRA - prevalence of traditional methods of contraception - have not been found to be statistically significant. Variation in these two variables across the districts of the country has been found to account for an insignificant proportion of the variation in FTI across the districts of the country.

Results of the regression analysis again highlight the need of considering birth planning in measuring and monitoring fertility transition so as to induce architectural corrections in fertility reduction efforts as outlined in the National Population Policy 2000. It is well known that the delay in the first birth and proper spacing between successive births significantly enhance the child survival probability and reduce maternal mortality in addition to health benefits to women. The mechanisms of these effects of birth planning are well known. These benefits, however, are not accrued through the use of terminal methods of family planning as these methods limit not space or delay births. From the perspective of the health rationale of family planning, it is imperative that due emphasis is given to birth planning along with birth limitation in efforts directed towards fertility reduction and population stabilisation. In order to ensure such a shift in the planning, implementation and monitoring and evaluation of fertility reduction and population stabilisation efforts, it is necessary that fertility transition is measured and monitored in the two dimensional space as shown in the present analysis.

6. Conclusions

The bleak scenario of fertility transition in India is reflected from the fact that almost 54 per cent of the most recent births reported during DLHS 2007-08 were 'excess' or 'undesired' births. More than 41 per cent of the most recent births reported during DLHS 2007-08 were 3rd and higher order births while more than 12 per cent births occurred in women aged less than 20 years. There are only a few districts in the country where an advanced stage of fertility transition appears to have been achieved according to DLHS 2007-08 as reflected through the fertility transition index (FLT). It is also clear from the analysis that fertility transition appears to be fairly advanced in only around 30 per cent of the districts of the country. In rest of the districts, transition appears to be lagging either in one dimension or in both the dimensions of fertility transition. There are many districts which are quite advanced on the dimension of birth limitation but lag behind on the dimension of birth planning. Most of these districts are in Andhra Pradesh, Maharashtra and West Bengal. On the other hand, there are a large number of districts which continue to be lag behind in the dimension of birth limitation. Most of these districts are located in Uttar Pradesh, Bihar and Jharkhand.

The analysis presented here highlights the importance of analysing fertility transition simultaneously in terms of birth planning and birth limitation as the National Population Policy 2000 emphasises both limiting the number of births as well as increasing the age at first birth and spacing between successive births. Transition in the dimension of birth planning is also important in the context of population stabilisation - minimising the impact of population momentum - and in the context of the health of women and children. Unfortunately, the information available through DLHS 2007-08 provides little indication of transition in birth planning. In some of the districts of the country, the proportion of births to women aged less than 20 years is alarmingly high which is a reflection of the neglected attention paid to the dimension of birth planning. A focus on birth planning is the need of the time as fertility is reaching the replacement level in an increasing number of states and the future population growth in these states will be the result of population momentum only. It is only through birth planning that the impact of population momentum on population growth can be minimised.

One approach to give long overdue attention to birth planning in India's efforts towards fertility reduction and population stabilisation is monitoring the implementation of these efforts on the two dimensional space comprising of the dimension of birth planning and the dimension of birth limitation. The fertility transition index (FTI) developed in this paper may constitute the basis for evolving such a system. The FTI has many advantages. First, it is not data intensive as is the case with the most commonly used index - the total fertility rate. It requires only the information about the age of the woman at birth and the order of the birth. Since, a birth is always a socially recognised event, it is possible to gather information necessary to estimate FTI even at the grass roots level. Second, the FTI is very simple to calculate and therefore can easily be calculated even at the community level. FTI can also be calculated on the basis of registered births even in situations where the registration of births is incomplete if it is assumed that there is no bias in the reporting and registration of births by the age of the woman or the order of the birth. It can also be calculated on the basis of hospital records and records available with the health workers. It can be estimated right up to the village level and can be the basis for decentralised planning for fertility reduction and population stabilisation programmes and activities as emphasised in the National Population Policy 2000.

Under the National Rural Health Mission, there are efforts to reinvigorate the health management information system. An important component of the health management information system is the reporting of live births. At present information about the sex of the new born is reported through the health management information system. It is recommended, that information about the order of the birth and the age of the mother at birth should also be reported through the health management information system. This information is routinely recorded in the records of all health care delivery institutions. Reporting of this information will facilitate calculation of FTI right up to the village level.

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Table 1
Fertility Transition Index (FLT) in India and States

India/State/ Union Territories	Births to women less than 20 years of age (Per cent)	3rd and higher order births (Per cent)	Fertility transition index (FTI)
India	12.86	41.10	0.460
Andman and Nikobar	9.53	18.05	0.724
Andhra Pradesh	22.92	20.72	0.564
Arunachal Pradesh	7.19	36.32	0.565
Assam	12.88	36.58	0.505
Bihar	15.33	57.86	0.268
Chandigarh	3.94	24.63	0.714
Chhattisgarh	15.08	45.32	0.396
Daman and Dieu	5.44	32.64	0.619
Delhi	5.66	32.33	0.620
Dadra and Nagar Haveli	12.78	43.61	0.436
Goa	4.90	17.65	0.775
Gujarat	9.69	35.91	0.544
Haryana	12.01	37.42	0.506
Himachal Pradesh	3.82	25.61	0.706
Jharkhand	14.85	50.35	0.348
Jammu and Kashmir	4.54	21.22	0.742
Karnataka	20.44	31.71	0.478
Kerala	6.03	17.00	0.770
Lakshadweep	1.69	42.16	0.561
Meghalaya	9.24	47.19	0.436
Manipur	4.50	43.43	0.521
Madhya Pradesh	13.48	36.04	0.505
Maharashtra	17.31	30.26	0.524
Mizoram	9.97	35.97	0.541
Nagaland	na	na	na
Orissa	10.44	33.05	0.565
Puducherry	5.48	9.57	0.849
Punjab	6.13	27.85	0.660
Rajasthan	13.84	42.64	0.435
Sikkim	11.51	34.66	0.538
Tamil Nadu	8.61	20.11	0.713
Tripura	18.34	28.90	0.528
Uttar Pradesh	12.62	58.80	0.286
Uttarakhand	5.95	37.78	0.563
West Bengal	24.72	29.72	0.456

Source: Author's calculations

Table 2
Location of states on the two dimensions of fertility

3rd and higher order births (Per cent)	Births to women aged less than 20 years (Per cent)				
	< 5	5-10	10-15	15-20	>= 20
<10		Puducherry			
10- 20	Goa	Kerala Andaman & Nikobar Tamil Nadu			
20-30	Jammu & Kashmir Chandigarh Himachal Pradesh	Punjab		Tripura	Andhra Pradesh West Bengal
30-40		Delhi Daman & Dieu Arunachal Pradesh Uttarakhand Mizoram	Assam Orissa Gujarat Sikkim Haryana Madhya Pradesh	Maharashtra	Karnataka
>=40	Lakshadeep Manipur	Meghalaya	Dadra & Nagar Haveli Rajasthan Jharkhand Uttar Pradesh	Chhattisgarh Bihar	

Source: Author's calculations

Table 3

Distribution of districts by fertility transition index in states and Union Territories

State/Country	Fertility Transition Index (FTI)					
	Very low <0.20	Low 0.20-0.40	Average 0.40-0.60	High 0.60-0.80	Very high ≥0.80	Total
Andhra Pradesh	0	1	12	10	0	23
Arunachal Pradesh	0	0	11	5	0	16
Assam	0	2	15	10	0	27
Bihar	2	35	0	0	0	37
Chhattisgarh	0	6	10	0	0	16
Delhi	0	0	3	6	0	9
Gujarat	0	1	15	9	0	25
Haryana	1	1	14	4	0	20
Himachal Pradesh	0	0	0	11	1	12
Jharkhand	0	16	6	0	0	22
Jammu & Kashmir	0	0	5	3	6	14
Karnataka	0	8	10	8	1	27
Kerala	0	0	1	5	8	14
Madhya Pradesh	0	5	31	9	0	45
Maharashtra	0	6	17	10	2	35
Manipur	0	1	4	4	0	9
Meghalaya	0	2	5	0	0	7
Mizoram	0	1	4	3	0	8
Orissa	0	3	18	9	0	30
Punjab	0	0	4	16	0	20
Rajasthan	0	9	23	0	0	32
Tamil Nadu	0	0	3	22	5	30
Uttar Pradesh	3	64	3	0	0	70
Uttarakhand	0	1	5	7	0	13
West Bengal	0	4	13	2	0	19
Small States & UTs	0	0	9	9	3	21
India	6	166	241	162	26	601
	1.00	27.62	40.10	26.96	4.33	100.00

Source: Author's calculations

Table 4

Distribution of districts by the proportion of 3rd and higher order births and the proportion of births to women aged less than 20 years in India and states.

Country/ State	3rd and higher order births (Per cent)	Births to women aged less than 20 years (Per cent)					
		<5	5-10	10-15	15-20	>=20	Total
India	<10	13	2	2	0	3	20
	10-20	12	18	6	7	10	53
	20-30	24	54	25	25	19	147
	30-40	19	42	50	21	17	149
	>=40	6	42	109	58	17	232
	Total	74	158	192	111	66	601
Andhra Pradesh	<10		0	0	0	2	2
	10-20		0	0	3	8	11
	20-30		1	1	0	6	8
	30-40		0	0	1	1	2
	>=40						
	Total		1	1	4	17	23
Arunachal Pradesh	<10						
	10-20	0	0	1			1
	20-30	0	2	0			2
	30-40	2	7	0			9
	>=40	2	0	2			4
	Total	4	9	3			16
Assam	<10						
	10-20		0	2	0		2
	20-30		4	3	0		7
	30-40		1	7	5		13
	>=40		0	4	1		5
	Total		5	16	6		27
Bihar	<10						
	10-20						
	20-30						
	30-40						
	>=40		2	18	16	1	37
	Total		2	18	16	1	37
Chhattisgarh	<10						
	10-20						
	20-30						
	30-40		0	2	2	0	4
	>=40		2	4	5	1	12
	Total		2	6	7	1	16

Country/ State	3rd and higher order births (Per cent)	Births to women aged less than 20 years (Per cent)					
		<5	5-10	10-15	15-20	>=20	Total
Delhi	<10						
	10-20						
	20-30	1	2				3
	30-40	2	4				6
	>=40						
	Total	3	6				9
Gujarat	<10						
	10-20	0	1	0			1
	20-30	1	7	2			10
	30-40	0	6	1			7
	>=40	0	1	6			7
	Total	1	15	9			25
Haryana	<10						
	10-20						
	20-30	1	2	1	1		5
	30-40	0	1	9	2		12
	>=40	0	0	2	1		3
	Total	1	3	12	4		20
Himachal Pradesh	<10						
	10-20	2	1				3
	20-30	3	2				5
	30-40	2	2				4
	>=40						
	Total	7	5				12
Jharkhand	<10						
	10-20						
	20-30						
	30-40		0	1	0		1
	>=40		2	7	12		21
	Total		2	8	12		22
Jammu & Kashmir	<10	6	0				6
	10-20						
	20-30	1	1				2
	30-40	1	2				3
	>=40	0	3				3
	Total	8	6				14
Karnataka	<10	0	0	0	0	1	1
	10-20	0	3	0	1	1	5
	20-30	2	1	2	3	1	9
	30-40	0	0	0	1	4	5
	>=40	0	0	0	0	7	7
	Total	2	4	2	5	14	27

Country/ State	3rd and higher order births (Per cent)	Births to women aged less than 20 years (Per cent)					
		<5	5-10	10-15	15-20	>=20	Total
Kerala	<10	5	0	0			5
	10-20	3	2	0			5
	20-30	0	2	0			2
	30-40	0	1	1			2
	>=40						
	Total	8	5	1			14
Meghalaya	<10						
	10-20						
	20-30						
	30-40		1	1			2
	>=40		3	2			5
	Total		4	3			7
Manipur	<10						
	10-20						
	20-30	2	0				2
	30-40	2	0				2
	>=40	1	4				5
	Total	5	4				9
Madhya Pradesh	<10						
	10-20	0	0	1	1	0	2
	20-30	0	1	5	5	0	11
	30-40	1	2	12	3	0	18
	>=40	0	2	9	2	1	14
	Total	1	5	27	11	1	45
Maharashtra	<10						
	10-20	2	2	0	0	0	4
	20-30	0	6	4	5	2	17
	30-40	0	0	2	1	8	11
	>=40	0	0	0	0	3	3
	Total	2	8	6	6	13	35
Mizoram	<10						
	10-20						
	20-30		1	2			3
	30-40		2	1			3
	>=40		1	1			2
	Total		4	4			8
Orissa	<10						
	10-20	1	1	0	0	0	2
	20-30	1	3	1	2	0	7
	30-40	2	6	4	1	1	14
	>=40	1	2	1	2	1	7
	Total	5	12	6	5	2	30

Country/ State	3rd and higher order births (Per cent)	Births to women aged less than 20 years (Per cent)					
		<5	5-10	10-15	15-20	>=20	Total
Punjab	<10						
	10-20						
	20-30	7	7				14
	30-40	1	5				6
	>=40						
	Total	8	12				20
Rajasthan	<10						
	10-20						
	20-30		0	0	5	0	5
	30-40		0	5	2	0	7
	>=40		4	10	5	1	20
	Total		4	15	12	1	32
Tamil Nadu	<10	1	2	1	0		4
	10-20	2	5	2	1		10
	20-30	2	8	2	2		14
	30-40	1	0	1	0		2
	>=40						
	Total	6	15	6	3		30
Uttar Pradesh	<10						
	10-20						
	20-30						
	30-40		0	1	0		1
	>=40		13	42	14		69
	Total		13	43	14		70
Uttarakhand	<10						
	10-20						
	20-30	2	2				4
	30-40	5	1				6
	>=40	0	3				3
	Total	7	6				13
West Bengal	<10						
	10-20			0	0	1	1
	20-30			1	2	9	12
	30-40			0	1	3	4
	>=40			0	0	2	2
	Total			1	3	15	19
Small States and Union Territories	<10	1	0	1	0	0	2
	10-20	2	3	0	1	0	6
	20-30	1	2	1	0	1	5
	30-40	0	1	2	2	0	5
	>=40	2	0	1	0	0	3
	Total	6	6	5	3	1	21

Source: Author's calculations

Table 5
Results of the regression analysis

Model	Variables in the model	B	SE(B)	Beta	't'	Sing	R^2
1	Constant	0.671	0.009		76.216	0.000	0.461
	MAR	-0.697	0.031	-0.680	-22.656	0.000	
2	Constant	0.765	0.012		64.777	0.000	0.549
	MAR	-0.465	0.036	-0.444	-12.722	0.000	
	LSL	-0.268	0.025	-0.380	-10.866	0.000	
3	Constant	0.649	0.018		37.036	0.000	0.598
	MAR	-0.434	0.034	-0.424	-12.805	0.000	
	LSL	-0.228	0.024	-0.323	-9.603	0.000	
	TER	0.244	0.029	0.233	8.547	0.000	
4	Constant	0.410	0.050		8.227	0.000	0.614
	MAR	-0.325	0.040	-0.317	-8.224	0.000	
	LSL	-0.160	0.027	-0.227	-5.985	0.000	
	TER	0.272	0.029	0.259	9.542	0.000	
	FLT	0.270	0.053	0.219	5.122	0.000	

Source Author's calculations

Table 6
Fertility Transition Index (FTI) in the districts of India, 2007-08

State	District	Births to women aged <20 years (Per cent)	3rd and higher order births (Per cent)	Fertility Transition Index (FTI)
Andaman & Nikobar	Andamans	11.51	20.86	0.676
	Nicobars	6.98	14.42	0.786
Andhra Pradesh	Adilabad	18.58	36.15	0.453
	Anantapur	25.37	21.39	0.532
	Chittoor	22.35	17.06	0.606
	Cuddapah	23.66	22.32	0.540
	East Godavari	31.14	18.56	0.503
	Guntur	27.98	7.34	0.647
	Hyderabad	6.57	23.23	0.702
	Karimnagar	14.05	21.62	0.643
	Khammam	17.46	16.40	0.661
	Krishna	23.85	11.30	0.649
	Kurnool	20.47	23.15	0.564
	Mahbubnagar	25.00	35.39	0.396
	Medak	23.74	21.94	0.543
	Nalgonda	31.03	21.98	0.470
	Nellore	22.45	15.31	0.622
	Nizamabad	17.76	19.63	0.626
	Prakasam	30.00	18.42	0.516
	Rangareddi	15.53	17.80	0.667
	Srikakulam	32.37	14.98	0.527
	Visakhapatnam	24.42	26.74	0.488
	Vizianagaram	32.08	18.33	0.496
	Warangal	20.61	20.00	0.594
	West Godavari	20.71	9.47	0.698
Arunachal Pradesh	Anjaw	6.59	34.13	0.593
	Changlang	9.15	37.80	0.530
	Upper Dibang Valley	5.81	22.82	0.714
	East Kameng	10.73	48.07	0.412
	East Siang	7.47	32.78	0.598
	Kurung Kumey	4.73	31.08	0.642
	Lohit	8.70	32.92	0.584
	Lower Dibang Valley	4.06	45.02	0.509
	Lower Subansiri	6.35	39.68	0.540
	Papum Pare	10.36	44.22	0.454
	Tawang	2.46	37.70	0.598
	Tirap	11.76	14.71	0.735
	Upper Siang	3.72	47.52	0.488
	Upper Subansiri	9.04	36.75	0.542
	West Kameng	8.49	30.89	0.606
	West Siang	9.88	25.93	0.642

State	District	Births to women aged <20 years (Per cent)	3rd and higher order births (Per cent)	Fertility Transition Index (FTI)
Assam	Barpeta	12.63	39.58	0.478
	Baska	13.06	22.04	0.649
	Bongaigaon	14.00	35.01	0.510
	Cachar	11.33	48.08	0.406
	Chirang	11.03	39.10	0.499
	Darrang	12.60	36.64	0.508
	Dhemaji	15.98	37.87	0.462
	Dhubri	18.10	34.91	0.470
	Dibrugarh	8.47	31.42	0.601
	Goalpara	13.55	38.21	0.482
	Golaghat	11.03	28.31	0.607
	Hailakandi	14.19	50.43	0.354
	Jorhat	13.82	25.33	0.609
	Kamrup	12.43	16.95	0.706
	Kamrup Metro	8.72	24.10	0.672
	Karbi Anglong	11.40	14.51	0.741
	Karimganj	16.59	55.30	0.281
	Kokrajhar	16.43	38.10	0.455
	Lakhimpur	15.22	30.21	0.546
	Marigaon	17.46	34.91	0.476
	Nagaon	12.53	40.87	0.466
	Nalbari	7.56	25.00	0.674
	North Cachar Hills	7.63	26.69	0.657
	Sibsagar	6.39	29.44	0.642
	Sonitpur	11.55	38.60	0.498
	Tinsukia	10.39	37.92	0.517
	Udalguri	10.45	41.79	0.478
Bihar	Araria	17.44	63.91	0.186
	Aurangabad	17.33	51.62	0.310
	Banka	20.57	54.70	0.247
	Begusarai	17.68	58.69	0.236
	Bhagalpur	14.86	60.53	0.246
	Bhojpur	19.37	55.54	0.251
	Buxar	14.84	57.42	0.277
	Darbhanga	14.93	57.56	0.275
	Gaya	19.20	56.59	0.242
	Gopalganj	13.19	54.40	0.324
	Jamui	16.77	55.34	0.279
	Jehanabad	16.08	54.27	0.296
	Kaimur Bhabua	12.39	60.77	0.268
	Katihar	13.66	59.20	0.271
	Khagaria	14.81	60.77	0.244
	Kishanganj	11.89	61.96	0.262

State	District	Births to women aged <20 years (Per cent)	3rd and higher order births (Per cent)	Fertility Transition Index (FTI)
	Lakhisarai	14.79	55.79	0.294
	Madhepura	18.48	58.31	0.232
	Madhubani	14.67	56.93	0.284
	Munger	15.17	50.25	0.346
	Muzaffarpur	11.11	55.56	0.333
	Nalanda	18.41	55.78	0.258
	Nawada	12.20	58.01	0.298
	Pashchim Champaran	14.75	63.60	0.216
	Patna	19.13	48.09	0.328
	Purba Champaran	16.62	58.61	0.248
	Purnia	11.90	63.10	0.250
	Rohtas	15.56	55.39	0.290
	Saharsa	18.83	55.27	0.259
	Samastipur	14.64	60.95	0.244
	Saran	9.98	57.62	0.324
	Sheikhpura	13.33	58.37	0.283
	Sheohar	13.76	63.06	0.232
	Sitamarhi	18.84	62.79	0.184
	Siwan	9.17	52.44	0.384
	Supaul	12.11	58.00	0.299
	Vaishali	18.26	53.53	0.282
Chandigarh	Chandigarh	3.94	24.63	0.714
Chhattisgarh	Bastar	15.50	49.79	0.347
	Bilaspur	18.08	50.89	0.310
	Dantewada	11.11	50.00	0.389
	Dhamtari	14.02	33.64	0.523
	Durg	10.85	38.98	0.502
	Janjgir-Champa	14.25	45.25	0.405
	Jashpur	10.54	47.06	0.424
	Kanker	16.72	42.82	0.405
	Kawardha	21.29	52.93	0.258
	Korba	13.53	44.27	0.422
	Koriya	18.81	47.02	0.342
	Mahasamund	15.48	40.00	0.445
	Raigarh	8.22	41.78	0.500
	Raipur	18.14	37.75	0.441
	Rajnandgaon	9.83	42.70	0.475
	Surguja	17.53	50.65	0.318
Daman & Dieu	Daman	7.77	22.97	0.693
	Diu	3.51	40.64	0.558
Delhi	Central	3.49	27.51	0.690
	East	4.15	33.22	0.626
	New Delhi	5.24	32.66	0.621

State	District	Births to women aged <20 years (Per cent)	3rd and higher order births (Per cent)	Fertility Transition Index (FTI)
	North	3.20	37.60	0.592
	North East	5.25	37.65	0.571
	North West	8.33	35.33	0.563
	South	6.40	33.23	0.604
	South West	6.86	22.38	0.708
	West	7.26	29.44	0.633
Dadra & Nagar Haveli	Dadra Nagar Haveli	12.78	43.61	0.436
Goa	North Goa	3.93	17.47	0.786
	South Goa	6.15	17.88	0.760
Gujarat	Ahmadabad	5.78	22.67	0.716
	Amreli	6.99	38.24	0.548
	Anand	7.06	36.86	0.561
	Banas Kantha	11.02	41.21	0.478
	Bharuch	9.12	25.55	0.653
	Bhavnagar	7.82	32.90	0.593
	Dohad	14.99	58.93	0.261
	Gandhinagar	7.25	28.99	0.638
	Jamnagar	6.08	28.90	0.650
	Junagarh	5.99	34.15	0.599
	Kachchh	9.73	45.90	0.444
	Kheda	7.95	25.76	0.663
	Mahesana	8.64	32.92	0.584
	Narmada	11.08	40.82	0.481
	Navsari	4.37	22.82	0.728
	Panch Mahals	9.49	39.24	0.513
	Patan	10.88	44.90	0.442
	Porbandar	7.92	30.00	0.621
	Rajkot	5.77	27.69	0.665
	Sabar Kantha	11.29	40.75	0.480
	Surat	9.43	16.80	0.738
	Surendranagar	13.06	38.83	0.481
	The dangs	13.69	42.03	0.443
	Vadodara	12.04	28.83	0.591
	Valsad	11.62	29.93	0.585
Haryana	Ambala	4.26	26.74	0.690
	Bhiwani	13.86	37.65	0.485
	Faridabad	16.36	45.91	0.377
	Fatehabad	12.50	32.14	0.554
	Gurgaon	10.80	38.85	0.503
	Hisar	16.67	35.07	0.483
	Jhajjar	13.47	32.32	0.542
	Jind	11.18	37.70	0.511
	Kaithal	10.43	33.33	0.562

State	District	Births to women aged <20 years (Per cent)	3rd and higher order births (Per cent)	Fertility Transition Index (FTI)
	Karnal	10.15	30.75	0.591
	Kurukshetra	7.27	29.07	0.637
	Mahendragarh	15.44	28.07	0.565
	Mewat	14.06	67.79	0.181
	Panchkula	7.41	26.60	0.660
	Panipat	12.92	43.54	0.435
	Rewari	11.45	29.29	0.593
	Rohtak	10.65	33.55	0.558
	Sirsa	11.23	30.80	0.580
	Sonipat	16.77	32.34	0.509
	Yamunanagar	8.36	30.77	0.609
Himachal Pradesh	Bilaspur	3.86	23.55	0.726
	Chamba	5.07	33.45	0.615
	Hamirpur	0.65	16.13	0.832
	Kangra	0.96	23.92	0.751
	Kinnaur	2.80	32.87	0.643
	Kullu	6.00	22.00	0.720
	Lahul Spiti	1.92	33.33	0.647
	Mandi	6.82	17.05	0.761
	Shimla	5.71	31.43	0.629
	Sirmaur	5.65	29.03	0.653
	Solan	2.53	27.00	0.705
	Una	1.91	18.70	0.794
Jharkhand	Bokaro	17.76	44.16	0.381
	Chatra	16.00	55.84	0.282
	Deoghar	14.79	47.69	0.375
	Dhanbad	18.21	40.75	0.410
	Dumka	16.76	40.52	0.427
	Garhwa	15.76	58.33	0.259
	Giridih	17.48	45.85	0.367
	Godda	17.97	46.10	0.359
	Gumla	9.73	59.29	0.310
	Hazaribagh	17.13	45.37	0.375
	Jamtara	17.57	41.65	0.408
	Kodarma	17.23	55.77	0.270
	Latehar	12.11	59.40	0.285
	Lohardaga	12.95	55.41	0.316
	Pakaur	16.13	54.84	0.290
	Palamu	13.31	56.28	0.304
	Pashchimi Singhbhum	10.53	51.50	0.380
	Purbi Singhbhum	10.42	30.50	0.591
	Ranchi	14.15	42.14	0.437
	Sahibganj	18.73	51.93	0.293

State	District	Births to women aged <20 years (Per cent)	3rd and higher order births (Per cent)	Fertility Transition Index (FTI)
	Seraikela	13.07	42.96	0.440
	Simdega	7.95	56.56	0.355
Jammu & Kashmir	Anantanag	3.35	1.78	0.949
	Badgam	2.59	2.59	0.948
	Baramula	2.42	1.88	0.957
	Doda	6.16	40.34	0.535
	Jammu	5.24	22.58	0.722
	Kargil	2.86	3.39	0.938
	Kathua	3.02	24.77	0.722
	Kupwara	5.47	43.21	0.513
	Leh Ladakh	2.93	33.89	0.632
	Pulwama	2.30	1.79	0.959
	Punch	9.00	50.48	0.405
	Rajauri	8.33	36.46	0.552
	Srinagar	1.63	2.61	0.958
	Udhampur	7.62	35.48	0.569
Karnataka	Bagalkot	27.35	45.01	0.276
	Bangalore	6.93	10.89	0.822
	Bangalore Rural	15.68	14.41	0.699
	Belgaum	18.98	31.53	0.495
	Bellary	21.74	36.34	0.419
	Bidar	24.62	37.24	0.381
	Bijapur	29.43	47.15	0.234
	Chamarajanagar	24.65	18.14	0.572
	Chikmagalur	9.09	15.79	0.751
	Chitradurga	24.26	22.43	0.533
	Dakshina Kannada	6.51	27.74	0.658
	Davanagere	22.07	32.76	0.452
	Dharwad	21.18	35.00	0.438
	Gadag	23.23	41.08	0.357
	Gulbarga	28.81	46.60	0.246
	Hassan	13.88	20.10	0.660
	Haveri	26.35	40.07	0.336
	Kodagu	8.30	17.90	0.738
	Kolar	17.87	29.28	0.529
	Koppal	33.77	46.19	0.200
	Mandya	21.60	7.51	0.709
	Mysore	19.66	21.37	0.590
	Raichur	27.21	43.26	0.295
	Shimoga	14.63	28.05	0.573
	Tumkur	18.18	25.97	0.558
	Udupi	3.13	21.43	0.754
	Uttara Kannada	4.57	28.31	0.671

State	District	Births to women aged <20 years (Per cent)	3rd and higher order births (Per cent)	Fertility Transition Index (FTI)
Kerala	Alappuzha	2.49	6.97	0.905
	Ernakulam	3.76	9.68	0.866
	Idukki	4.46	6.93	0.886
	Kannur	4.63	10.68	0.847
	Kasaragod	6.04	30.20	0.638
	Kollam	2.76	7.83	0.894
	Kottayam	2.34	15.42	0.822
	Kozhikode	8.79	22.34	0.689
	Malappuram	10.79	34.99	0.542
	Palakkad	7.87	18.50	0.736
	Pathanamthitta	1.17	7.02	0.918
	Thiruvananthapuram	3.65	10.94	0.854
	Thrissur	9.45	11.44	0.791
	Wayanad	9.82	22.46	0.677
Lakshadeep	Lakshadweep	1.69	42.16	0.561
Meghalaya	East Garo Hills	10.44	46.52	0.430
	East Khasi Hills	6.78	39.45	0.538
	Jaintia Hills	9.94	45.13	0.449
	Ri Bhoi	10.10	38.22	0.517
	South Garo Hills	8.48	66.96	0.246
	West Garo Hills	7.44	60.79	0.318
	West Khasi Hills	10.16	46.78	0.431
Manipur	Bishnupur	3.61	34.02	0.624
	Chandel	6.77	48.18	0.451
	Churachandpur	5.46	51.54	0.430
	Imphal East	3.64	28.64	0.677
	Imphal West	1.14	28.57	0.703
	Senapati	6.99	50.82	0.422
	Tamenglong	5.84	55.25	0.389
	Thoubal	2.95	36.61	0.604
	Ukhrul	3.44	54.76	0.418
Madhya Pradesh	Balaghat	2.87	31.15	0.660
	Barwani	10.39	47.10	0.425
	Betul	8.52	41.64	0.498
	Bhind	15.02	34.04	0.509
	Bhopal	6.09	41.94	0.520
	Chhatarpur	11.81	39.70	0.485
	Chhindwara	9.28	26.65	0.641
	Damoh	14.45	38.05	0.475
	Datia	16.39	28.74	0.549
	Dewas	14.85	36.41	0.487
	Dhar	20.00	51.17	0.288
	Dindori	11.80	36.96	0.512

State	District	Births to women aged <20 years (Per cent)	3rd and higher order births (Per cent)	Fertility Transition Index (FTI)
	East Nimar	12.92	39.48	0.476
	Guna	12.24	16.00	0.718
	Gwalior	14.29	20.63	0.651
	Harda	11.64	45.60	0.428
	Hoshangabad	13.38	45.77	0.408
	Indore	17.18	23.28	0.595
	Jabalpur	9.16	30.68	0.602
	Jhabua	18.04	59.15	0.228
	Katni	9.24	33.89	0.569
	Mandla	14.67	33.00	0.523
	Mandsaur	11.97	24.92	0.631
	Morena	19.05	27.08	0.539
	Narsimhapur	19.41	36.26	0.443
	Neemuch	10.79	33.61	0.556
	Panna	11.00	38.00	0.510
	Raisen	14.32	50.78	0.349
	Rajgarh	12.75	20.40	0.669
	Ratlam	11.54	40.17	0.483
	Rewa	16.20	29.81	0.540
	Sagar	11.60	37.35	0.510
	Satna	10.24	44.74	0.450
	Sehore	12.65	49.64	0.377
	Seoni	12.50	28.47	0.590
	Shahdol	13.68	30.53	0.558
	Shajapur	17.30	36.33	0.464
	Sheopur	12.96	44.97	0.421
	Shivpuri	15.63	14.51	0.699
	Sidhi	12.05	45.89	0.421
	Tikamgarh	18.28	25.38	0.563
	Ujjain	12.26	38.70	0.490
	Umaria	10.78	39.87	0.494
	Vidisha	12.45	20.39	0.672
	West Nimar	23.36	53.93	0.227
Maharashtra	Ahmadnagar	18.15	28.83	0.530
	Akola	10.73	29.76	0.595
	Amravati	11.88	31.80	0.563
	Aurangabad	26.20	39.04	0.348
	Bhandara	4.28	17.12	0.786
	Bid	26.02	37.13	0.368
	Buldana	22.48	28.19	0.493
	Chandrapur	5.88	13.03	0.811
	Dhule	19.10	35.82	0.451
	Gadchiroli	13.74	34.25	0.520

State	District	Births to women aged <20 years (Per cent)	3rd and higher order births (Per cent)	Fertility Transition Index (FTI)
	Gondiya	5.66	25.66	0.687
	Hingoli	30.19	40.43	0.294
	Jalgaon	21.55	42.09	0.364
	Jalna	26.80	32.04	0.412
	Kolhapur	10.49	24.72	0.648
	Latur	26.28	33.42	0.403
	Mumbai	7.20	29.24	0.636
	Mumbai Suburban	9.75	26.27	0.640
	Nagpur	5.91	21.67	0.724
	Nanded	22.74	34.27	0.430
	Nandurbar	20.26	43.90	0.358
	Nashik	19.60	29.57	0.508
	Osmanabad	24.84	30.50	0.447
	Parbhani	26.08	38.71	0.352
	Pune	16.67	23.58	0.598
	Raigarh	6.60	27.92	0.655
	Ratnagiri	5.21	24.17	0.706
	Sangli	16.81	25.86	0.573
	Satara	12.45	20.75	0.668
	Sindhudurg	2.14	16.58	0.813
	Solapur	25.18	30.58	0.442
	Thane	11.99	29.79	0.582
	Wardha	5.83	16.67	0.775
	Washim	23.34	29.39	0.473
	Yavatmal	19.14	27.22	0.536
Mizoram	Aizawl	7.32	30.31	0.624
	Champhai	10.12	27.18	0.627
	Kolasib	9.46	38.65	0.519
	Lawngtlai	14.83	47.32	0.379
	Lunglei	8.14	47.77	0.441
	Mamit	11.88	39.67	0.485
	Saiha	10.48	29.75	0.598
	Serchhip	6.20	28.68	0.651
Orissa	Anugul	9.15	30.17	0.607
	Balangir	3.45	48.28	0.483
	Baleshwar	9.27	30.73	0.600
	Bargarh	10.15	33.46	0.564
	Baudh	8.41	38.63	0.530
	Bhadrak	2.85	30.38	0.668
	Cuttack	8.05	23.75	0.682
	Debagarh	11.15	29.00	0.599
	Dhenkanal	12.15	34.03	0.538
	Gajapati	15.05	54.30	0.306

State	District	Births to women aged <20 years (Per cent)	3rd and higher order births (Per cent)	Fertility Transition Index (FTI)
	Ganjam	15.95	27.30	0.567
	Jagatsinghapur	3.83	19.14	0.770
	Jajapur	4.29	24.49	0.712
	Jharsuguda	6.40	33.60	0.600
	Kalahandi	5.99	50.23	0.438
	Kandhamal	8.08	40.07	0.519
	Kendrapara	4.15	30.03	0.658
	Kendujhar	14.79	32.30	0.529
	Khordha	7.36	13.57	0.791
	Koraput	21.79	37.43	0.408
	Malkangiri	19.41	54.12	0.265
	Mayurbhanj	15.33	33.33	0.513
	Nabarangapur	22.15	49.54	0.283
	Nayagarh	18.15	23.33	0.585
	Nuapada	8.09	33.09	0.588
	Puri	5.73	24.37	0.699
	Rayagada	13.41	43.73	0.429
	Sambalpur	6.15	25.82	0.680
	Sonapur	12.13	32.46	0.554
	Sundargarh	9.68	37.10	0.532
Puduchery	Karaikal	4.18	12.55	0.833
	Mahe	2.71	2.71	0.946
	Puducherry	6.31	14.41	0.793
	Yanam	10.16	9.09	0.807
Punjab	Amritsar	8.33	32.64	0.590
	Barnala	9.00	28.62	0.624
	Bathinda	8.33	23.61	0.681
	Faridkot	8.66	29.53	0.618
	Fatehgarh Sahib	4.23	21.48	0.743
	Firozpur	8.33	30.56	0.611
	Gurdaspur	4.96	27.10	0.679
	Hoshiarpur	2.23	21.34	0.764
	Jalandhar	2.89	31.05	0.661
	Kapurthala	3.45	27.59	0.690
	Ludhiana	6.36	27.54	0.661
	Mansa	8.67	26.33	0.650
	Moga	6.56	34.75	0.587
	Muktsar	7.37	35.44	0.572
	Nawanshahr	3.83	28.74	0.674
	Patiala	6.61	29.57	0.638
	Nupnagar	2.44	24.04	0.735
	Sangrur	8.68	21.56	0.698
	SAS Nagar Mohali	4.40	25.16	0.704

State	District	Births to women aged <20 years (Per cent)	3rd and higher order births (Per cent)	Fertility Transition Index (FTI)
	Tarn Taran	7.41	33.70	0.589
Rajasthan	Ajmer	10.61	45.66	0.437
	Alwar	15.20	38.67	0.461
	Banswara	17.58	51.56	0.309
	Baran	14.22	44.02	0.418
	Barmer	6.32	56.84	0.368
	Bharatpur	17.96	38.37	0.437
	Bhilwara	18.16	47.43	0.344
	Bikaner	17.03	41.08	0.419
	Bundi	11.97	35.90	0.521
	Chittaurgarh	13.99	31.20	0.548
	Churu	14.72	43.15	0.421
	Dausa	16.09	45.71	0.382
	Dhaulpur	13.52	59.43	0.270
	Dungarpur	10.81	46.55	0.426
	Ganganagar	15.61	29.96	0.544
	Hamumangarh	15.25	27.68	0.571
	Jaipur	20.30	41.58	0.381
	Jaisalmer	14.70	48.33	0.370
	Jalore	8.76	47.41	0.438
	Jhalawar	19.41	27.13	0.535
	Jhunjhunun	15.17	28.28	0.566
	Jodhpur	12.33	43.49	0.442
	Karauli	16.73	50.37	0.329
	Kota	15.22	27.46	0.573
	Nagaur	13.62	39.29	0.471
	Pali	9.63	50.42	0.399
	Rajsamand	11.56	44.09	0.444
	Sawai Madhopur	14.65	34.78	0.506
	Sikar	13.30	35.70	0.510
	Sirohi	6.54	49.49	0.440
	Tonk	12.89	42.63	0.445
	Udaipur	11.63	44.65	0.437
Sikkim	East	9.87	28.34	0.618
	North	9.55	37.44	0.530
	South	12.96	34.49	0.525
	West	13.79	37.93	0.483
Tamil Nadu	Ariyalur	12.67	25.79	0.615
	Chennai	5.88	10.78	0.833
	Coimbatore	8.29	7.80	0.839
	Cuddalore	5.45	25.91	0.686
	Dharmapuri	18.69	25.70	0.556
	Dindigul	11.67	20.00	0.683

State	District	Births to women aged <20 years (Per cent)	3rd and higher order births (Per cent)	Fertility Transition Index (FTI)
	Erode	10.37	5.49	0.841
	Kancheepuram	9.24	13.87	0.769
	Kanniyakumari	4.25	7.08	0.887
	Karur	9.63	23.53	0.668
	Krishnagiri	18.96	27.01	0.540
	Madurai	6.64	19.47	0.739
	Nagapattinam	7.05	24.90	0.680
	Namakkal	9.30	9.88	0.808
	Nilgiris	11.06	14.04	0.749
	Pudukottai	3.68	23.53	0.728
	Ramanathpuram	3.69	21.72	0.746
	Salem	18.39	13.90	0.677
	Sivganga	4.55	15.91	0.795
	Thanjavur	5.65	23.04	0.713
	Theni	13.14	20.57	0.663
	Thirunelveli	6.80	22.33	0.709
	Thiruvallur	6.97	15.98	0.770
	Thiruvarur	7.23	22.49	0.703
	Thoothukudi	2.45	18.14	0.794
	Tiruvannamalai	8.29	25.37	0.663
	Trichy	8.25	28.16	0.636
	Vellore	10.83	30.32	0.588
	Viluppuram	4.88	30.89	0.642
	Virudhunagar	8.09	19.08	0.728
Tripura	Dhalai	17.51	34.81	0.477
	North Tripura	17.18	38.65	0.442
	South Tripura	21.39	21.13	0.575
	West Tripura	17.17	19.58	0.633
Uttar Pradesh	Agra	14.73	55.56	0.297
	Aligarh	14.54	56.78	0.287
	Allahabad	14.85	56.62	0.285
	Ambedaker Nagar	9.31	55.85	0.348
	Auraiya	15.38	58.02	0.266
	Azamgarh	8.82	51.73	0.394
	Baghpat	12.65	54.42	0.329
	Bahraich	12.80	67.99	0.192
	Ballia	8.73	56.34	0.349
	Balrampur	10.16	66.62	0.232
	Banda	13.46	60.00	0.265
	Barabanki	11.55	63.87	0.246
	Bareilly	12.10	63.00	0.249
	Basti	9.84	57.56	0.326
	Bijnor	8.65	61.54	0.298

State	District	Births to women aged <20 years (Per cent)	3rd and higher order births (Per cent)	Fertility Transition Index (FTI)
	Budaun	15.90	67.56	0.165
	Bulandshahar	13.47	54.11	0.324
	Chandauli	11.11	56.03	0.329
	Chitrakoot	11.52	64.21	0.243
	Deoria	12.34	50.38	0.373
	Etah	18.20	63.26	0.185
	Etawah	19.88	55.58	0.245
	Faizabad	11.01	57.14	0.319
	Farrukhabad	13.82	63.28	0.229
	Fatehpur	13.10	60.89	0.260
	Firozabad	12.58	57.06	0.304
	Gautam Buddha Nagar	12.80	57.73	0.295
	Ghaziabad	11.54	53.04	0.354
	Ghazipur	14.44	56.51	0.291
	Gonda	10.06	64.41	0.255
	Gorakhpur	13.29	46.24	0.405
	Hamirpur	12.68	51.41	0.359
	Hardoi	14.42	63.60	0.220
	Hathras	16.20	61.52	0.223
	Jalaun	15.88	48.10	0.360
	Jaunpur	6.96	56.52	0.365
	Jhansi	14.29	38.46	0.473
	Jyotiba Phule Nagar	10.87	58.98	0.301
	Kannauj	13.85	61.19	0.250
	Kanpur Dehat	10.72	54.55	0.347
	Kanpur Nagar	9.27	52.90	0.378
	Kaushambi	11.66	64.01	0.243
	Kheri	15.66	59.30	0.250
	Kushinagar	14.05	56.91	0.290
	Lalitpur	19.51	56.44	0.241
	Lucknow	8.92	51.69	0.394
	Maharajganj	15.38	53.67	0.309
	Mahoba	18.81	52.06	0.291
	Mainpuri	14.62	60.20	0.252
	Mathura	17.04	57.17	0.258
	Mau	5.95	57.91	0.361
	Meerut	10.34	55.56	0.341
	Mirzapur	13.55	58.59	0.279
	Moradabad	10.89	64.42	0.247
	Muzaffarnagar	10.34	54.99	0.347
	Pilibhit	10.94	58.97	0.301
	Pratapgarh	8.19	55.88	0.359
	Rae bareli	9.79	61.21	0.290

State	District	Births to women aged <20 years (Per cent)	3rd and higher order births (Per cent)	Fertility Transition Index (FTI)
	Rampur	11.08	67.06	0.219
	Saharanpur	7.27	52.21	0.405
	Sant Kabir Nagar	10.92	55.93	0.331
	Sant Ravidas Nagar	15.15	55.45	0.294
	Shahjahanpur	11.40	68.57	0.200
	Shrawasti	15.21	61.98	0.228
	Siddharthnagar	10.68	66.91	0.224
	Sitapur	11.95	63.05	0.250
	Sonbhadra	18.37	59.18	0.224
	Sultanpur	9.97	53.16	0.369
	Unnao	10.22	59.41	0.304
	Varanasi	12.59	48.25	0.392
Uttarakhand	Almora	3.78	29.21	0.670
	Bageshwa	6.77	29.35	0.639
	Chamoli	3.33	26.67	0.700
	Champawat	9.48	45.40	0.451
	Dehradun	8.95	43.68	0.474
	Garhwal	1.92	35.58	0.625
	Hardwar	8.24	51.79	0.400
	Nainital	4.97	39.13	0.559
	Pithoragarh	5.08	28.25	0.667
	Rudraprayag	2.85	30.25	0.669
	Tehri garhwal	3.63	34.27	0.621
	Udham Singh Nagar	8.99	38.85	0.522
	Uttarkashi	4.19	39.94	0.559
West Bengal	Bankura	25.24	22.01	0.528
	Barddhaman	27.53	21.25	0.512
	Birbhum	32.02	28.57	0.394
	Dakshin Dinajpur	31.77	24.55	0.437
	Darjiling	17.15	23.01	0.598
	Haora	15.03	25.17	0.598
	Hugli	21.72	14.34	0.639
	Jalpaiguri	18.33	32.48	0.492
	Koch Bihar	28.72	31.23	0.401
	Kolkata	14.56	24.68	0.608
	Maldah	25.37	42.29	0.323
	Murshidabad	31.91	34.15	0.339
	Nadia	27.39	21.58	0.510
	North Twenty Four Parganas	23.62	23.62	0.528
	Paschim Medinipur	33.22	22.37	0.444
	Purab Medinipur	20.62	20.06	0.593
	Puruliya	24.74	34.90	0.404
	South Twenty Four Parganas	22.38	28.67	0.490
	Uttar Dinajpur	20.43	49.85	0.297