

## FERTILITY TRENDS AND PATTERN IN MAHARASHTRA (A DISTRICT LEVEL ANALYSIS, 1971-2018)

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**Abstract:** The paper examines fertility trends and differentials at the districts in the state of Maharashtra using data available from the Census of India, the Sample Registration System, National Family Health Surveys, and Fertility at District Level in India: Lessons from the 2011 Census. The bivariate analysis of changes and trends has been conducted from 1971 to 2018. The analysis revealed that Maharashtra has achieved below replacement level fertility but there are wide inter-district differential in fertility rates. The study shows a fluctuating trend in fertility decline. It registered a steep drop during 1971-81 with a moderate fall during 1981-91 and again steep drop during 1991-2001 and 2001-2011 decade but a slow decline during 2011-2018. There has been a correspondence between fertility decline and socio-economic development, decline in higher-order births of three and above and decrease in fertility among older women in the age group 30 and above. Fertility differentials by education, caste, religion, and occupation exist in Maharashtra.

*Keywords: Fertility, trends, differentials, marital fertility, Maharashtra*

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Date of submission: 01.10.2020

Date of review: 29.11.2020

Date of acceptance: 11.12.2020

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### Introduction

Maharashtra has though experienced a substantial decline in fertility to achieve below replacement level fertility, but there are wide spatial variations on this count. In some districts fertility is though declining but continues to remain well above the replacement level. The importance of acceleration in fertility reduction efforts cannot be understated, especially in districts having a slow fertility transition.

The experiences of the European countries indicate that during the early stages of fertility transition of a country, urban fertility differs from rural fertility, urban fertility usually lower than the rural (Mosk, 1980). A study on rural-urban differentials in India using the Sample Registration System data during 1970-80 revealed that there was a decline in marital fertility at the older ages and a marginal increase in the younger age groups. Urban women were found to have lower fertility than their rural counterparts; and voluntary fertility control was the main reason behind a larger decline in marital fertility (Pathak and Murthy, 1987). In their study on fertility trends and differentials in Andhra Pradesh, Ramchandran and Ramesh (2005) examined fertility differentials in terms of education, religion, caste, and occupation. A strong negative association was observed between the educational level of women and fertility, rural and urban areas both.

Another study found that increasing contraceptive prevalence rate has relatively low impact on birth rate because most of the acceptors desired as well as had three or more children (Kulkarni, 1994). It is found that mean number of children ever born among adolescents decreased steadily during 1992-2006. The total fertility rate is declining in India as well as in Maharashtra, the teenage fertility is still high but its contribution to the total fertility rate shows a decline (Dutta and Sarkar, 2014). The pattern of fertility decline varies across

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districts and between rural and urban areas. Maharashtra government announced its New Population Policy to reduce fertility by various specific interventions linked to the acceptance of small family norms (Government of Maharashtra, 2000).

According to 2011 Census, population of Maharashtra was 112.4 million making 9.4 per cent in total population of India. Maharashtra ranks the third in area but the second in area in the country. Nearly one-fifth of its population belongs to scheduled (caste/tribe) population, separately 10.2 per cent castes and 8.8 per cent tribes. The density of population was 365 persons/ km<sup>2</sup> in 2011, increased from 164 persons/ km<sup>2</sup> in 1971. Decadal growth of population has declined from 27.5 per cent in 1971 to 16.0 percent in 2001-11. The state has urbanized fast, urban population has grown by about one and half times from 31.2 per cent in 1971 to 45.2 per cent in 2011. The sex ratio has declined slightly from 930 to 929 females/1000 males during last four decades between 1971 and 2011.

According to Sample Registration System data, the total fertility rate in Maharashtra is 1.7 in 2018; rural fertility rate (1.8) is higher as compared to urban (1.5). The factors underlying the fertility differentials are, however, a matter of debate among the scholars and the policymakers.

### Rationale of the research problem

For a long time, the focus of various socio-economic development programs in India has remained either at macro or meso spatial scales. The fertility related programs are not an exception to this. In their studies, the scholars and academicians have also focused on national level or state level studies in looking at the levels of and the trends in fertility rates. Notwithstanding the wide differential in the levels and trends of fertility rates at the micro or district level, there are only a sporadic literature on the trends and patterns of fertility rates at the district level. Moreover, the sample registration system has repeatedly been recording substantial differentials in fertility rates by residence, religion, caste/tribe, and socio-economic characteristics of population living in different districts.

Finding a research gap, the present paper attempts to examine the factors responsible for variations in fertility trends and patterns at district level by making Maharashtra a case study in the light of the following research questions.

### Research questions

1. What have been the trends in fertility transition in Maharashtra during 1971-2018?
2. How the fertility rates differ across districts, and between rural and urban areas?
3. What are the correlates of fertility transition in Maharashtra as a whole as well as at the district level?

### Materials and Methods

For conducting the present study of fertility trends and differentials at the district level in Maharashtra data were picked from the *Census of India*, the *Sample Registration System*, the

*National Family Health Surveys, and Fertility at District Level in India: Lessons from the 2011 Census*, a study published in *Economic and Political Weekly*. Data on age-specific fertility rates, age-specific marital fertility rate, total fertility rate and total marital fertility rate from 1971 to 2018 has been used for the purpose.

Bivariate technique has been used to analyse the distribution of currently married women at age of 15 to 49 by socio-economic characteristics, such as religion, caste/tribe, education, and occupation. The bivariate analysis of changes and trends has been done to study the association between total fertility rate and socio-economic characteristics of women such as religion, caste/tribe, education, and occupation from 1971 to 2018.

## DISCUSSION AND RESULTS

### Vital rates in Maharashtra

Population growth in a region depends on fertility, mortality, and migration. Population grew at accelerated rate in Maharashtra up to 1971, to register a marginal decline in 1981. The decadal population growth came down to 24.5 per cent during 1981-91 from 27.5 per cent during 1971-81. Further decline in fertility was witnessed in 1991, 2001, 2011, and 2018. The crude birth rate (CBR) in Maharashtra has declined from 32.2 per thousand persons in 1971 to 28.5 in 1981 and to 26.2 in 1991 (Table 1).

**Table 1: Trends in birth rate, death rate and infant mortality rate of Maharashtra, 1971-2018**

Year	Birth Rate			Death Rate			Infant Mortality Rate		
	Total	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban
1971	32.2	33.7	29	12.3	13.5	9.7	105	111	88
1981	28.5	30.4	24.5	9.6	10.6	7.4	79	90	49
1991	26.2	28	22.9	8.2	9.3	6.2	60	69	38
2001	20.7	21.1	20.2	7.5	8.5	5.9	45	55	28
2011	16.7	17.3	15.8	6.3	7.3	5.1	25	30	17
2018	15.6	15.9	15.2	5.5	6.3	4.5	19	24	14

Source: *Vital Statistics Division*, Office of Registrar General and Census Commissioner, New Delhi, for 2009, 2011 and 2018

It further declined to 20.7 in 2001, 16.7 in 2011, and 15.6 per thousand persons in 2018. CBR in rural Maharashtra has declined from 33.7 per thousand persons in 1971 to 15.9 per thousand persons in 2018 whereas in urban areas it declined from 29.0 per thousand persons to 15.2 per thousand persons during the same period. CBR has declined by 51.6 per cent in Maharashtra. Interestingly, the contribution of rural areas in declining birth rate was higher (52.8 per cent) than their urban counterparts (42.6 per cent) during 1971-2018. Similarly, CDR has also declined from 12.3 per thousand persons in 1971 to 8.2 per thousand persons in 1991; further to 8.5 per thousand persons in 2001, 6.3 per thousand persons in 2011, and 5.5 per thousand persons in 2018. CDR in rural areas of Maharashtra has declined from 13.5 per thousand persons in 1971 to 6.3 per thousand persons in 2018, against this decline in urban areas was from 9.7 per thousand persons in 1971 to 4.5 per thousand persons in 2018. The CDR has declined by 55.3 per cent in Maharashtra; the contribution of urban areas was marginally higher (53.6 per cent) than rural

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areas (53.3 per cent) during 1971-2018. Infant Mortality Rate (IMR) in Maharashtra has steadily declined from 105 in 1971 to 60 in 1991. It further declined from 45 in 2001 to 25 in 2011 and 19 in 2018. IMR in rural and urban areas has declined from 111 and 88 in 1971 to 24 and 14 in 2018, respectively. IMR in Maharashtra has declined by 81.9 per cent; urban areas contributing higher (84.1 per cent) than their rural counterparts (78.4 per cent). All the three rates (CBR, CDR, and IMR) are higher in rural than urban areas.

### Fertility trends in Maharashtra

The age-specific fertility rates (per 1000 women) are much higher among younger age groups than older age groups of women. Similarly these are higher in rural than urban areas of Maharashtra. There is a consistent decline in fertility rate by residence among all age groups. The age-specific fertility rates declined from 1971 to 2018 in both urban and rural areas. The peak age of child bearing is 20-29, with steadily declining fertility rates thereafter. The high fertility is still concentrated in the prime childbearing age 20-29 years both in urban and rural areas. Fertility rates declined sharply beyond the age of 30, to reach extremely low level for women age 40-44 and 45-49. Early child bearing (in the age group 15-19) is declining in Maharashtra accounting for 2.64 per cent of births. The contribution of early child bearing (age 15-19) is higher (3.21 per cent) in urban areas than the rural areas (2.25 per cent) in Maharashtra. It is also found that 71 per cent of births occur among women below the age of 30 consisting of 75.6 per cent in rural areas and 64.5 per cent in urban (Table 2). The age-specific marital fertility rates also follow an almost similar pattern to the total fertility rate. The fertility in the higher age groups (mothers aged 35 and above) has fallen substantially in rural areas, as couples choose to limit their family size, and stop having children after they have had the desired number (between two and three children per woman on average). The fertility in urban areas, among older women has grown, as better educated women are able to delay marriage and childbirth, and improved healthcare allows women to have children later in life. While fertility in general is lower among more educated women, there is one notable exception: in urban areas, fertility rates among women in their 30s are higher among better educated rather than less educated women.

The total fertility rate (TFR) declined considerably from 1971 to 2018 in Maharashtra. The fertility seems to have remained stable at around 5 children per woman before 1971. The pace of fertility decline accelerated with time. For example, estimated TFR of 4.6 in 1971 declined to 3.6 in 1981, to 3.0 in 1991, 2.4 in 2001, 1.8 in 2011, and 1.7 in 2018 (Table 3). Maharashtra had experienced a steep fall during 1971-81, moderate during 1981-91 and again steep during 1991-2001 and 2001-2011, but sluggish decline during 2011-2018. The annual decline (in percentage) during 1971-2018 was 1.35 for the state. The comparison of the TFR between 1971-81 and 1981-91 shows that the rate of decline in the TFR has been lower during 1981-91 (1.67 per cent per annum) compared to 2.17 per cent earlier during 1971-81. The comparison of the TFR between 1981-91 and 1991-2001 indicates that the rate of decline has been higher during 1991-2001 (2.0 per cent/year) compared to 1.67 per cent during 1981-1991. The comparison of the TFR between 1991-2001 and 2001-2011 indicates that the rate

of decline in TFR has been higher during 2001-2011 (2.5 per cent) compared to 2.0 per cent per annum during 1991-2001. Similarly, the comparison of the TFR between 2001-2011 and 2001-2018 indicates that the rate of decline has been higher in 2001-2011 (2.5 per cent per annum) compared to 0.79 per cent during 2011-2018. On average, now a woman in Maharashtra gives birth to two children (1.7) as compared to five in the early 1970s.

In 1971, TFR in Maharashtra was 4.9 in rural and 3.9 in urban areas, differing by more than 25.0 per cent. By 2018, these rates came down to 1.8 and 1.5, respectively, giving a difference of 20.0 per cent. During 1971-2018, average annual decline in TFR being 1.34 per cent for entire Maharashtra it was 1.35 per cent in rural and 1.31 per cent in urban areas. In the recent period (i.e. 2001-2018), the fertility decline in urban Maharashtra has been faster (an average annual decline of 0.89 per cent in the TFR) as compared to 0.75 per cent in rural areas. The difference between rural and urban TFRs has decreased from 25.0 per cent in 1971 to 20.0 per cent in 2018. The total marital fertility is also followed an almost similar pattern like the total fertility rate. The fertility decline occurred in the state due to higher rates of literacy and education, along with greater equality for women. With increased access to education, economic and other development opportunities, there has been a sharp decline in fertility during recent decades. Women's education and labour force participation seem to have played a key role in reduction of TFR. The decline in fertility during 2001-2011 is largely explained by increase in contraceptive use with a small contribution from rising age at marriage. The fertility decline during 2011-18 is due to increases in abortion and rising age at marriage.

Prior to 1990s, women's education, reduction in child mortality, and the rising cost of child bearing were the leading factors in fertility decline (Dreze and Murthi 2001; UN 1987). Since 1990s, the diffusion process is said to be the leading factor in fertility decline. More than three-fifths of the decline in fertility in the 1990s was contributed by the illiterate or less educated women (Bhat 2002; Arokiasamy 2009). The transition is being driven by the increased use of the contraceptive. The education has played a key role in reduction of TFR. The decline in fertility during 2001-2011 is largely explained by an increase in contraceptive use with a small contribution from rising age at marriage. The fertility decline during 2011-18 is due to increase in abortion and rising age at marriage (IIPS and ICF, 2018).

**Table 2: Trends in age-specific fertility rate and age-specific marital fertility rate by residence from 1971 to 2018 in Maharashtra**

Age Group	Age-Specific Fertility Rate							Age-Specific Marital Fertility Rate					
	1971	1981	1991	2001	2011	2018	Change (%) 1971-2018	1984	1991	2001	2011	2018	Change (%) 1984-2018
<b>Total</b>													
15-19	79.0	80.9	80.0	44.9	28.6	8.8	88.86	240.0	228.0	192.9	155.3	200.3	16.54
20-24	226.0	232.8	238.4	226.1	179.5	119.1	47.30	326.4	308.2	321.0	261.1	272.9	16.39
25-29	233.0	202.3	173.1	140.8	107.5	107.2	53.99	206.4	190.9	160.4	123.7	147.2	28.68
30-34	185.0	123.6	74.6	46.9	34.8	69.0	62.70	108.9	80.2	51.0	37.9	78.6	27.82
35-39	115.0	59.3	32.2	18.7	9.1	21.1	81.65	47.0	35.0	20.4	10.0	23.0	51.06
40-44	46.0	21.1	9.4	5.4	1.6	6.1	86.74	17.1	10.6	6.1	1.8	6.7	60.82
45-49	17.0	9.6	1.3	2.0	0.4	1.6	90.59	4.2	1.5	2.4	0.5	1.8	57.14
<b>Rural</b>													
15-19	81.0	90.9	99.3	55.2	38.8	8.1	90.00	222.7	224.3	183.1	157.8	175.6	21.15
20-24	243.0	249.8	263.0	254.0	213.8	138.2	43.13	318.5	307.8	322.4	266.1	279.4	12.28
25-29	236.0	214.5	177.7	134.9	104.0	126.0	46.61	212.0	190.3	148.1	112.5	164.6	22.36
30-34	209.0	136.7	80.1	43.7	23.2	60.3	71.15	115.5	85.7	47.1	24.9	67.8	41.30
35-39	126.0	70.0	37.7	18.3	6.4	20.3	83.89	53.2	41.0	19.9	7.0	21.8	59.02
40-44	53.0	24.4	12.6	5.2	1.8	6.0	88.68	20.1	14.3	5.8	2.0	6.4	68.16
45-49	18.0	11.4	1.6	2.7	0.5	1.5	91.67	3.9	2.0	3.2	0.6	1.6	58.97
<b>Urban</b>													
15-19	75.0	57.2	41.2	27.9	13.6	9.7	87.07	15-19	299.7	247.7	233.1	145.6	238.6
20-24	198.0	200.1	197.4	186.7	136.2	95.6	51.72	20-24	341.1	309.0	318.5	251.7	262.1
25-29	226.0	180.3	165.9	149.2	111.1	89.5	60.40	25-29	197.8	192.0	179.3	136.6	129.0
30-34	137.0	98.4	65.7	51.7	47.5	77.2	43.65	30-34	97.4	71.3	57.0	52.5	88.8
35-39	87.0	36.8	23.1	19.3	12.3	22.0	74.71	35-39	33.2	25.1	21.2	13.5	24.2
40-44	30.0	13.8	3.7	5.6	1.4	6.3	79.00	40-44	10.6	4.2	6.4	1.6	6.9
45-49	5.0	5.0	0.5	0.9	0.3	1.8	64.00	45-49	5.1	0.6	1.0	0.3	2.1

Source: As Table 1

**Table 3: Maharashtra: Trends in TFR and total marital fertility rate by residence, 1971-2018**

Year	TFR			TMFR		
	Total	Rural	Urban	Total	Rural	Urban
1971	4.6	4.9	3.9			
1981	3.6	4.0	3.0	4.8	4.7	4.9
1991	3.0	3.4	2.5	4.3	4.3	4.2
2001	2.4	2.6	2.2	3.8	3.6	4.1
2011	1.8	1.9	1.6	3.0	2.9	3.0
2018	1.7	1.8	1.5	3.7	3.6	3.8
<b>Index of TFR</b>						
1971	100	100	100			
1981	78	82	77	100	100	100
1991	65	69	64	90	91	86
2001	52	53	56	79	77	84
2011	39	39	41	63	62	61
2018	37	37	38	77	77	78
<b>TFR: Annual decline (in percent)</b>						
1971-1981	2.17	1.84	2.31			
1981-1991	1.67	1.50	1.67	1.49	1.22	2.04
1991-2001	2.00	2.35	1.20	1.16	1.63	0.24
2001-2011	2.50	2.69	2.73	2.11	1.94	2.68
2011-2018	0.79	0.75	0.89	-3.33	-3.45	-3.81
1971-2018	1.34	1.35	1.31	0.67	0.69	0.66

Source: As Table 1

### The pattern of Higher-Order Births

Distribution of live births by order of birth gives an idea of the total number of children ever born to an eligible woman, broadly speaking about the small family preference. An examination of trends in the pattern of higher-order births (four or more) also indicates to fertility decline in Maharashtra. Change in higher-order births is a good indicator of fertility change and helps to assess the overall fertility impact of contraceptive prevalence. Since the focus of family planning program in India is to reduce higher-order births, changes in proportion of higher-order births over a period are expected to reflect changes in fertility levels. The proportion of lower-order births is expected to increase with reduction in higher-order births when fertility declines high to low level. It is noticeable that the percentage of births to four children or more declined from about 20.0 per cent in 1991 to only 2.4 per cent in 2018 (Table 4).

**Table 4: Maharashtra: Distribution (%) of live births by order of birth, 1991-2018**

Year	Birth Order											
	Total				Rural				Urban			
	1	2	3	4+	1	2	3	4+	1	2	3	4+
1991	32.1	27.2	21.1	19.6	30.9	26.8	21.8	20.5	35.8	28.3	19.1	16.9
2001	38.9	32.1	16.4	12.6	38.1	31.6	17.1	13.2	40.4	33.0	15.2	11.4
2011	47.8	34.9	11.6	5.7	46.8	35.3	12.3	5.6	49.2	34.4	10.6	5.9
2018	59.6	29.4	8.7	2.4	59.5	29.8	8.3	2.4	59.7	28.8	9.1	2.3

Source: As Table 1



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As expected, the percentage of the first and the second-order births has increased during 1991-2018: from 32.1 per cent and 27.2 per cent to 59.6 percent and 29.4 percent, respectively. The share of 3 order births has also declined from 21.1 per cent to 8.7 per cent during 1991-2018. It may also be noticed that the share of birth order up to 2 has increased from 59.3 percent in 1991 to 89 percent in 2018 whereas the percentage of birth order above 3 has declined from 40.7 per cent in 1991 to 11.1 per cent in 2018, showing the evidence of fertility decline in Maharashtra. The same is true for rural and urban areas both.

### Inter-district differentials in fertility rates

There are wide inter-district variations in fertility rates in Maharashtra. Among districts, Akola, Amravati, Bhandara, Chandrapur, Gadchiroli, Jalgaon, Mumbai, Nagpur, Raigarh, Ratnagiri, Satara, Sindhudurg, Wardha, and Yavatmal districts have experienced a faster pace of fertility transition as compared to other districts (Table 5). Seventeen out of thirty-five districts namely Amravati, Bhandara, Chandrapur, Gadchiroli, Gondiya, Kolhapur, Mumbai, Mumbai Suburban, Nagpur, Pune, Raigarh, Ratnagiri, Sangali, Satara, Sindhudurg, Thane, and Wardha achieved the replacement level fertility (TFR = 2.1) in 2011.

In 1981, the highest TFR (5.0) was found in Nanded and Yavatmal districts and the lowest (3.4) in Mumbai district, with a difference of 32.0 per cent. In 1991, the highest TFR (4.6) was registered in Akola, Aurangabad, and Nanded districts and the lowest (2.9) in Kolhapur district, differing by 37.0 per cent. In 2001, the highest TFR (3.4) was found in Hingoli district and the lowest (1.6) in Mumbai district, differing by 53.0 per cent. Coming to 2011, Jalna district registered the highest TFR (3.2) and Mumbai and Sindhudurg districts the lowest (1.4), difference of 56.0 per cent. Evidently, differential level in TFR among districts increased during 1981-2011.

Based on the estimated values of TFR in 2011, all the districts fall in the first four groups (Table 6). Sixteen districts of Bhandara, Chandrapur, Gadchiroli, Gondiya, Kolhapur, Mumbai, Mumbai Suburban, Nagpur, Pune, Raigarh, Ratnagiri, Sangli, Satara, Sindhudurg, Thane, and Wardha fall in Group I, where fertility have attained the replacement level. In another six districts, where fertility is approaching near replacement level fall in Group II. These included Ahmadnagar, Akola, Amravati, Jalgaon, Solapur, and Yavatmal districts. The group III, which consists of ten districts and the TFR ranging between 2.5 and 2.99, included Aurangabad, Buldhana, Dhule, Hingoli, Latur, Nanded, Nandurbar, Nashik, Osmanabad, and Washim. The fourth group IV, TFR ranging between 3 and 3.99, consists of Bid, Jalna, and Parbhani districts.

Inter-group movement of districts during the study period makes an interesting story. Kolhapur, Mumbai, Pune, Sangali, Satara, and Thane districts, in the Group IV in 1981, moved up to reach Group I in 2011. Ahmadnagar moved from IV to II Group II; Bhandara, Chandrapur, Gadchiroli, Nagpur, Raigarh, Ratnagiri, Sindhudurg, and Wardha districts moved from V to I Group during the same period. Akola, Amravati, Jalgaon, and Solapur districts moved from V to Group II; Aurangabad, Buldhana, Dhule, Latur, Nashik, and Osmanabad from V to Group



III. Similarly, Bid, Jalna, and Parbhani falling in Group V moved to IV; and Nanded and Yavatmal districts from VI to III and II Groups, respectively during this period. Any further reduction in fertility in Maharashtra state would depend upon the pace of fertility decline in 13 districts of Bid, Jalna, Parbhani, Aurangabad, Buldhana, Dhule, Hingoli, Latur, Nanded, Nandurbar, Nashik, Osmanabad, and Washim districts, where the current levels are considerably high.

**Table 5: Trends of fertility in the districts of Maharashtra, 1981-2011**

Districts	Total Fertility Rate				% decline in TFR			
	Census		Guilmoto and Rajan 2001	Guilmoto and Rajan 2011	1981-91	1991-2001	2001-2011	1981-2011
	1981	1991						
Ahmadnagar	3.8	3.8	2.7	2.3	0.0	-28.9	-14.8	-39.5
Akola	4.7	4.6	2.7	2.2	-2.1	-41.3	-18.5	-53.2
Amravati	4.8	4.0	2.5	2.0	-16.7	-37.5	-20.0	-58.3
Aurangabad	4.6	4.6	3.1	2.8	0.0	-32.6	-9.7	-39.1
Bhandara	4.5	3.8	2.4	1.9	-15.6	-36.8	-20.8	-57.8
Bid	4.3	4.4	3.2	3.0	2.3	-27.3	-6.3	-30.2
Buldhana	4.6	4.5	3.0	2.6	-2.2	-33.3	-13.3	-43.5
Chandrapur	4.8	3.8	2.4	1.8	-20.8	-36.8	-25.0	-62.5
Dhule	4.8	4.2	2.7	2.6	-12.5	-35.7	-3.7	-45.8
Gadchiroli	4.8	4.0	2.9	2.0	-16.7	-27.5	-31.0	-58.3
Gondiya	Na	Na	2.5	1.9	na	Na	-24.0	Na
Hingoli	Na	Na	3.4	2.9	na	Na	-14.7	Na
Jalgaon	4.8	3.9	2.7	2.4	-18.8	-30.8	-11.1	-50.0
Jalna	4.3	4.5	3.2	3.2	4.7	-28.9	0.0	-25.6
Kolhapur	3.5	2.9	2.3	1.8	-17.1	-20.7	-21.7	-48.6
Latur	4.6	4.3	3.1	2.6	-6.5	-27.9	-16.1	-43.5
Mumbai	3.4	3.0	1.6	1.4	-11.8	-46.7	-12.5	-58.8
Mumbai Suburban	Na	Na	2.0	1.6	na	Na	-20.0	Na
Nagpur	4.6	3.5	2.2	1.8	-23.9	-37.1	-18.2	-60.9
Nanded	5.0	4.6	3.3	2.8	-8.0	-28.3	-15.2	-44.0
Nandurbar	Na	Na	3.3	2.9	na	Na	-12.1	Na
Nashik	4.7	4.1	3.1	2.6	-12.8	-24.4	-16.1	-44.7
Osmanabad	4.6	3.9	3.0	2.6	-15.2	-23.1	-13.3	-43.5
Parbhani	4.3	4.5	3.3	3.0	4.7	-26.7	-9.1	-30.2
Pune	3.6	3.2	2.3	2.0	-11.1	-28.1	-13.0	-44.4
Raigarh	4.4	3.8	2.3	2.0	-13.6	-39.5	-13.0	-54.5
Ratnagiri	4.0	3.7	2.1	1.6	-7.5	-43.2	-23.8	-60.0
Sangali	3.5	3.0	2.3	1.9	-14.3	-23.3	-17.4	-45.7
Satara	3.8	3.3	2.3	1.9	-13.2	-30.3	-17.4	-50.0
Sindhudurg	4.0	3.3	1.8	1.4	-17.5	-45.5	-22.2	-65.0
Solapur	4.2	3.5	2.7	2.4	-16.7	-22.9	-11.1	-42.9
Thane	3.9	3.4	2.6	2.1	-12.8	-23.5	-19.2	-46.2
Wardha	4.6	3.5	2.3	1.7	-23.9	-34.3	-26.1	-63.0
Washim	Na	Na	3.0	2.5	na	Na	-16.7	Na
Yavatmal	5.0	3.9	2.9	2.2	-22.0	-25.6	-24.1	-56.0

Sources: i) Registrar General, 1989, 1997; ii) Guilmoto, C. Z. and I. Rajan, 2013

Table 6: Maharashtra: Classification of districts according to level of TFR, 1981-2011

Group	TFR	Census Year		Guilmoto and Rajan 2001	Guilmoto and Rajan 2011
		1981	1991		
I	< 2.10			Mumbai, Mumbai Suburban, Ratnagiri, Sindhudurg,	Bhandara, Chandrapur, Gadchiroli, Gondiya, Kolhapur, Mumbai, Mumbai Suburban, Nagpur, Pune, Raigarh, Ratnagiri, Sangli, Satara, Sindhudurg, Thane, Wardha
II	2.11-2.49			Bhandara, Nagpur, Chandrapur, Pune, Kolhapur, Raigarh, Sangli, Satara, Wardha	Ahmadnagar, Akola, Amravati, Jalgaon, Solapur, Yavatmal
III	2.50-2.99		Kolhapur,	Ahmadnagar, Akola, Amravati, Dhule, Gadchiroli, Thane, Gondiya, Jalgaon, Solapur, Yavatmal	Aurangabad, Buldhana, Dhule, Hingoli, Latur, Nanded, Nandurbar, Nashik, Osmanabad, Washim
IV	3.00-3.99	Ahmadnagar, Kolhapur, Mumbai, Pune, Sangli, Satara, Thane	Ahmadnagar, Bhandara, Chandrapur, Jalgaon, Pune, Mumbai, Nagpur, Raigarh, Osmanabad, Ratnagiri, Sangli, Satara, Sindhudurg, Solapur, Thane, Wardha, Yavatmal	Aurangabad, Bid, Buldhana, Hingoli, Jalna, Latur, Nanded, Nandurbar, Nashik, Osmanabad, Parbhani, Washim	Bid, Jalna, Parbhani
V	4.00-4.99	Akola, Amravati, Jalna, Aurangabad, Bhandara, Bid, Buldhana, Dhule, Latur, Chandrapur, Gadchiroli, Jalgaon, Nagpur, Nashik, Raigarh, Parbhani, Osmanabad, Ratnagiri, Sindhudurg, Solapur, Wardha	Akola, Amravati, Bid, Aurangabad, Buldhana, Dhule, Gadchiroli, Jalna, Latur, Nagpur, Nanded, Nashik, Parbhani, Raigarh, Ratnagiri, Sindhudurg, Solapur, Wardha		
VI	5 and above	Nanded, Yavatmal			

Source: Computed from Table 6

### Fertility differentials by educational level of women

An examination of age-specific fertility and TFR rates by educational level and residence of women in Maharashtra reveals that there are marked rural-urban differences in the state. The rural areas, in general, reported higher level of fertility than their urban counterparts for all age groups. Fertility attains the peak in 20-24 years age-group both in rural and urban areas except for the women having educational level 12<sup>th</sup> and above. With few exceptions, 'Literate' women have lower levels of age-specific fertility rates than the 'Illiterate' women both in rural and urban areas (Table 7). Within the 'Literate' group there is a general decline in the fertility rates with the increase in the educational status both in rural and urban areas. The total fertility rate is lower (1.6) for the women having only the informal educational status as compared to 'Illiterate' women (1.9). It is quite intriguing that the women having educational status 'primary' and 'middle' have recording the highest TFR of all the

educational levels even including the 'illiterate' women both in rural and urban areas of the state. A cursory look at the table reveals that it is mainly because of their highest TFR in the age-groups of 20-24 and 25-29 years. However, it requires a further research investigation even a re-look of the data by the data providing agencies.

**Table 7: Age-specific fertility rates and total fertility rates by education in Maharashtra, 2018**

Age Group	Illiterate	Literacy/educational level							
		Total Literates	Without any formal education	Below primary	Primary	Middle	Class X	Class XII	Graduate and above
<b>Total</b>									
15-19	19.3	8.8	11.4	9.0	9.2	7.0	8.6	12.2	0.0
20-24	126.0	119.5	96.9	118.3	205.3	163.1	132.4	86.5	70.8
25-29	144.9	106.9	128.9	83.5	141.6	117.7	104.7	118.0	77.5
30-34	58.4	69.7	25.5	94.2	63.9	59.6	67.0	77.8	79.3
35-39	25.9	20.9	19.5	17.4	21.7	25.6	16.0	19.5	26.1
40-44	12.3	5.6	12.8	1.0	7.1	3.5	5.3	4.3	10.0
45-49	0.5	1.8	0.6	0.8	0.0	0.9	1.2	12.4	0.2
<b>TFR</b>	<b>1.9</b>	<b>1.7</b>	<b>1.5</b>	<b>1.6</b>	<b>2.2</b>	<b>1.9</b>	<b>1.7</b>	<b>1.7</b>	<b>1.3</b>
<b>Rural</b>									
15-19	14.8	8.1	8.0	4.4	8.8	5.7	8.7	11.5	0.0
20-24	148.0	139.0	90.3	69.9	199.1	172.7	147.0	112.0	98.1
25-29	178.8	125.9	98.2	85.9	147.7	141.7	116.9	150.3	83.2
30-34	18.7	61.9	29.8	95.3	60.8	56.3	56.1	77.6	56.2
35-39	19.8	20.4	24.4	15.9	21.0	27.7	14.9	19.3	21.5
40-44	5.9	6.0	4.2	1.5	9.5	5.0	5.4	5.1	17.7
45-49	1.1]	1.5	0.9	1.1	0.0	1.5	2.2	5.7	1.3
<b>TFR</b>	<b>1.9</b>	<b>1.8</b>	<b>1.3</b>	<b>1.4</b>	<b>2.2</b>	<b>2.1</b>	<b>1.8</b>	<b>1.9</b>	<b>1.4</b>
<b>Urban</b>									
15-19	23.8	9.7	19.4	17.8	10.0	9.1	8.5	12.6	0.0
20-24	107.6	95.5	16.3	180.1	214.5	146.7	105.0	59.1	61.5
25-29	126.6	88.8	15.6	80.5	134.9	89.1	88.8	82.7	75.5
30-34	80.6	77.0	13.3	92.8	67.2	63.6	80.8	78.1	85.7
35-39	30.0	21.6	4.6	20.3	22.6	22.6	17.3	19.7	27.2
40-44	17.0	5.2	33.8	0.0	3.7	1.7	5.2	3.8	8.3
45-49	0.0	2.1	0.0	0.0	0.0	0.0	0.0	17.7	0.0
<b>TFR</b>	<b>1.9</b>	<b>1.5</b>	<b>2.0</b>	<b>2.0</b>	<b>2.3</b>	<b>1.7</b>	<b>1.5</b>	<b>1.4</b>	<b>1.3</b>

Source: Registrar General, 2018

#### **Fertility differentials by socio-economic and other characteristics of women**

Apart from the residence and educational level, religion, caste, and occupation also affect the fertility rates. Muslim women have exhibited higher fertility than that Hindus in all the surveys. The scheduled tribe women were found to have the highest fertility as compared to

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women among scheduled castes and other backward class and other castes. However, these differentials have not been the same in all the surveys.

**Table 8: Maharashtra: Fertility differentials by religious and caste groups, 1978-2016**

SRS/NFHS	Socioeconomic characteristics	TFR		TMFR	
		Rural	Urban	Rural	Urban
1978 (SRS)	Hindu	3.62	2.64	4.22	4.11
	Muslim	4.74	3.81	5.51	5.38
1984 (SRS)	Hindu	4.2	3.2	5.0	4.8
	Muslim	4.9	4.3	7.7	6.2
NFHS	<b>Religion</b>	1992-93	1998-99	2005-06	2015-16
	Hindu	2.69	2.45	2.00	1.82
	Muslim	4.11	3.30	2.85	2.33
	Buddhist/Neo-Buddhist	3.14	2.14	2.35	1.73
	Other	1.65	2.87	1.44	1.38
	<b>Caste/tribe</b>				
1978 (SRS)	Scheduled Castes	3.38	4.18	3.90	5.61
	Scheduled Tribes	3.68	3.53	4.67	4.64
	Non-SC/ST	3.60	2.78	4.23	4.31
1984 (SRS)	Scheduled Caste	4.1	3.5	4.7	4.8
	Scheduled Tribe	4.6	3.4	5.6	4.4
	Non SC/ST	4.2	3.7	4.9	5.0
NFHS	<b>Caste/tribe</b>	1992-93	1998-99	2005-06	2015-16
	Scheduled Caste	3.04	2.42	2.14	1.88
	Scheduled Tribe	3.24	2.93	2.43	2.19
	Other backward class	Na	2.19	1.98	1.72
	Other	2.80	2.59	2.10	1.85
	<b>Occupation</b>				
1978 (SRS)	Worker	3.23	2.10	3.81	4.15
	Non-worker	4.76	3.01	4.74	4.44
1984 (SRS)	Worker	Na	Na	4.9	4.0
	Non-worker	Na	Na	5.2	5.2

Sources: Census of India, 1981 and 1989

IIPS, 1995; IIPS and ORC Macro, 2001, IIPS and Macro International, 2008 and IIPS and Macro International, 2018

The fertility differentials have also been observed between working and non-working women. The non-working women were having higher fertility as compared to working women. According to the National Family Health Surveys (NFHS), TFR has been regularly declining from the first to fourth survey. NFHS-1, conducted in 1992-93, TFR in Maharashtra was 2.86, which declined to 2.52 in the NFHS-2, conducted in 1998-99, it declined further to 2.11 in NFHS-3, conducted in 2005-06, and then to 1.9 in NFHS 4, conducted in 2015-16. In this way, the fertility declined by around one child (0.96) between NFHS-1 and NFHS 4. This decline was more than half-child (0.62) between NFHS-2 and NFHS-4. Currently, TFR in Maharashtra is 1.9 children per woman, which is below the replacement level. Fertility has declined by 0.2 children in a period of ten years between NFHS-3 and NFHS-4. Even the fertility of 2.1 children per woman in rural Maharashtra, is almost at the replacement level. Fertility in urban Maharashtra, which is 1.7 children per woman, is well below the replacement level.

The fertility rates for other backward class (OBC) women are at replacement level and lower than for scheduled castes and scheduled tribes women. The fertility rate for Hindu women (1.8) is below replacement level, whereas it is above replacement level for Muslim women (2.3). The fertility rate for Muslim woman was half child higher than that for a Hindu woman. Happily, the results from the National Family Health Surveys indicate that: (i) fertility is declining among the all socioeconomic groups, and (ii) fertility differentials are narrowing down with time i.e. from 1992-93 to 2015-16.

Briefly, fertility differentials exist by education, religion, caste/tribe, and occupation. The education is playing an important role in the declining fertility in the state of Maharashtra. The educational level creates more differentials in TFR than in the TMFR, since the influence of education on fertility is mainly through age at marriage. Socio-economic factors of development play a vital role in fertility decline, especially the decline in higher-order births of three and above and that of fertility among older women in the age group 30 and above. Socio-economic development can more effectively reduce the fertility rate if the emphasize is placed on an equal distribution of benefits. This would entail a more widely dispersed development program, stressing wider improvements in conditions, influencing fertility reduction. There is a negative relationship between education and fertility. This indicates that women education has contributed to lower fertility. Therefore, the education of the girls needs to be encouraged with strict implementation of minimum legal age at marriage. There is a need to place a larger thrust on rural areas and districts with high fertility for achieving universal below-replacement fertility in all the districts of Maharashtra. In other words, area specific approach would provide the most desirable results in this context.

*Acknowledgement:* The author expresses his gratitude to the anonymous referee, who reviewed the manuscript of the paper submitted earlier for consideration of publication in Population Geography for making useful suggestions for further improvements in the paper.

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