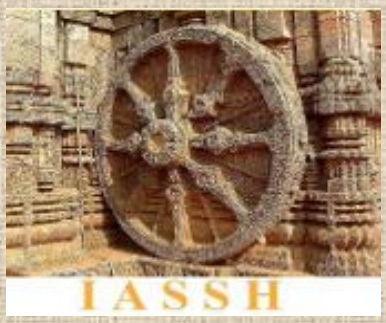

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Fertility Decline in India- from an Alarmingly High Level to a Worryingly Low Level

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ABSTRACT

In the early 1970s, India was faced with a situation of high population growth which had raised Malthusian concerns and fears of population explosion. But over time, transition to low fertility became evident and the population growth rate showed a decline. The fertility transition also brought in a favourable change in the age structure with prospects of potential demographic dividend. However, recent evidence shows that fertility has reached sub-replacement level and is likely to be even lower in the foreseeable future, and hence some new worries have emerged- a large increase in the share of the elderly, which will raise old age dependency, and the likelihood of decline in the population size in the long run. In view of this, the paper traces the path of the fertility decline and explores into its causes. As evidence on the increasing preference for a one-child family in parts of the country has emerged, plausible reasons for this, including whether this is attributable to the Second Demographic Transition, are discussed. Finally, the paper touches upon the possibilities of changes in fertility behaviour that could raise fertility to or above replacement level.

Introduction

About fifty years ago, in the 1970s, India was faced with a situation of high population growth, exceeding two percent per annum, and there was widespread concern about the implications of such growth for the development of the country. In fact, India was not alone in this situation; most of the developing world was experiencing high population growth brought about by a welcome mortality decline that was not matched by any notable decline in fertility. The spectre of Malthusian conditions of misery and population explosion emerged. The rapid growth was foreseen earlier, in India and elsewhere in the developing countries, and neo-Malthusian programmes of fertility regulation or control, broadly called family planning programmes, were introduced. But many of these made little impact and Davis (1971) questioned whether these would succeed at that time. India had launched its family planning programme in the early 1950s which was strengthened over time. However, in spite of the programme being in place for some time, fertility remained fairly high, with the Total Fertility Rate (TFR) around 5, in the early 1970s. India suffered from a series of droughts in the 1960s and the 1970s and rapid population growth was perceived as the principal obstacle to ensuring food security and to achieving overall economic development. There were calls in the media and the civil society for 'strong' measures to lower fertility. In 1976, the Government of India announced a National Population Policy that called for tough measures for fertility control and intensified the programme. While the intensification backfired, with a massive political fallout and condemnation of the coercive measures, the programme continued but in a moderate mode.

Gradually, fertility decline was seen and estimates from the Sample Registration System (SRS) show that by the end of the 1980s a few states had reached low replacement level fertility (Registrar General, 2019). By the turn of the century, many states had reached low fertility with the TFR well below 3 and the national average barely over 3. This was reflected in the fall in the population growth rate, which declined from over 2 percent per annum through the 1960s-80s, to a shade below two percent during the decade 1991-2001 and further fell conspicuously

to 1.63 percent during the intercensal decade 2001-2011(as computed from Table A-2, Registrar General, 2013). Over time, fertility declined further and by 2020, the TFR fell to 2.0 as seen from the estimates of the SRS for 2020 and the fifth round of the National Family Health Survey (NFHS) conducted during 2019-21 (Registrar General, 2022; IIPS and ICF, 2021). Fertility has thus fallen slightly below the replacement level. As the census scheduled for 2021 was postponed, we do not have the growth rate during 2011-21 but projections by the Technical Group on Population Projections show this to be close to 1.2 percent during 2011-21 and further lower at 0.8 percent during 2021-31 (National Commission on Population, 2020). According to the Medium Variant of the projections by the U.N. Population Division (World Population Prospects 2024), the TFR for India is projected to fall further to 1.69 and the population projected to reach a peak of 1.7 billion and then begin to decline gradually (U.N., 2024).

With the fall in fertility, the Malthusian concerns so prominent during the second half of the last century seem to have faded out some time ago. On the other hand, awareness that the transition is changing the age structure of the population towards a rise in the share of working age population and this could contribute to potential demographic dividend emerged. Thus, the population factor, which was considered as detrimental to development in the past because of rapid population growth, came to be seen now as a positive contributor to development on account of the demographic dividend. However, more recently, consequences of the low fertility, which has reached sub-replacement level and is likely to be even lower in the foreseeable future, have raised some new concerns. A large increase in the share of the elderly will raise the burden of old age dependency and the demographic dividend will be phased out in the next few decades. Besides, as the fertility transition has staggered across states, inter-state imbalances in population growth have begun to emerge and are likely to be even greater in future with implications for representation of states in the parliament and allocation of finances to states (Kulkarni, 2021). Moreover, regional growth imbalances could cause heavy in-migration to some regions. Finally, decline in the population size in the long run has geopolitical implications. Many countries in Europe as well as in Eastern Asia including China have begun to experience fall in population size and this has perturbed policymakers. Such worries have been expressed in India recently.

In view of the concerns, it is desirable to see what has brought about this decline in fertility. This will give some pointers to whether the decline in fertility will continue, will fertility reach a low point and stay at around that level, or will there be some revival to near replacement level fertility. The paper first traces the transition in fertility especially over the period 1970 to 2020. This is followed by an assessment of the causes of the decline. Evidence on the increasing preference for a one-child family is presented and plausible reasons for this, including whether the Second Demographic Transition is in operation in India, are discussed. At the end, implications of sub-replacement fertility and possible changes in the future are noted.

Fertility decline since 1970

First, it is in order to briefly trace the transition in fertility. Indirect estimates based on census data show that fertility in India was fairly high with the TFR hovering around 6 during the first seven decades of the twentieth century (Rele, 1987; Bhat, 1998; Ram and Ram, 2009). Trends in the TFR since 1970 are available from the SRS. Data from other sources are also available, especially the rounds of the NFHS since 1992-93, but these are at irregular intervals. As the estimates from the SRS are available annually since 1970, one can get a good idea of trends from this series as shown in Figure 1.

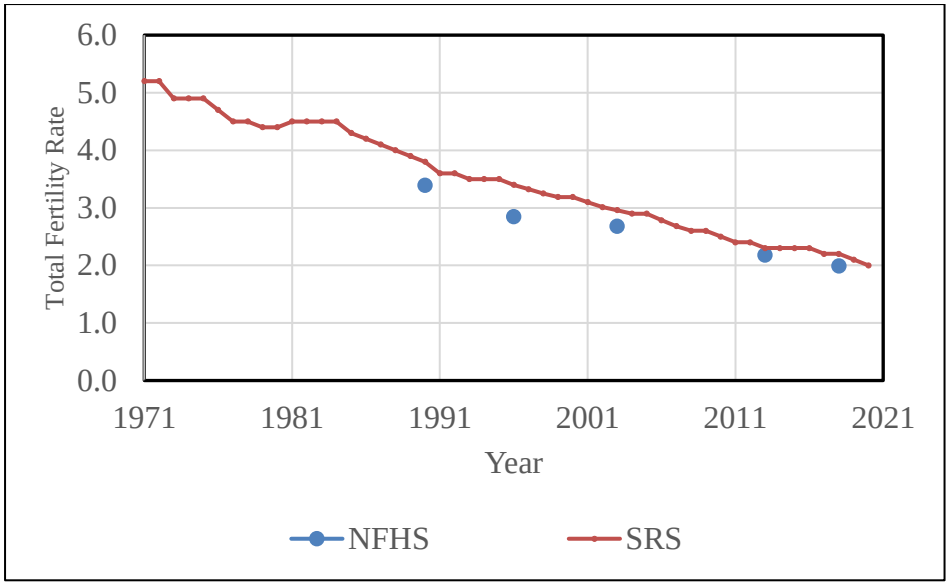

Figure 1: Trends in Total Fertility Rate, India, from the Sample Registration System, 1970-2020 and the National Family Health Survey rounds 1-5.
Sources: Registrar General (2019, 2020, 2021, 2022); IIPS (1995), IIPS and ORC Macro (2000), IIPS and Macro International (2007), IIPS and ICF (2017), IIPS and ICF (2021).

Fertility declined in the mid to late-1970s but there was stagnation for some time after that. However, a clear and fairly steady decline is seen since the mid-1980s. Over the period 1970 to 2020, TFR declined from about 5 to 2. The NFHS estimates are generally only marginally lower than the SRS estimates for the corresponding periods.

Table 1: Trends in Total Fertility Rate, Contraceptive Prevalence and Indicators of Marriage, NFHS- 1 to NFHS-5

NFHS Round (years)	Total Fertility Rate (TFR)	Median age of females at first marriage	Percent females never married in ages			Contraceptive prevalence rate (%)	
			15-19	20-24	25-29	Any method	Modern method
1 (1992-93)	3.39	16.4	60.7	15.5	4.7	40.7	36.5
2 (1998-99)	2.85	16.7	66.4	21.2	5.5	48.2	42.8
3 (2005-06)	2.68	17.2	69.6	24.3	5.8	56.3	48.5
4 (2015-16)	2.18	19.0	83.6	33.2	8.4	53.5	47.7
5 (2019-21)	1.99	19.2	87.3	39.2	10.6	66.7	56.5

Sources: IIPS (1995), IIPS and ORC Macro (2000), IIPS and Macro International (2007), IIPS and ICF (2017), IIPS and ICF (2021).

Data from the five rounds of the NFHS allow us to assess the changes in the indicators of contraceptive prevalence and marriage (median age at marriage for females, percent females never married in early reproductive ages, 15-19, 20-24, 25-29) over time. This, of course, covers the period from the first round of the NFHS, that is, 1992-93, up to the fifth round, 2019-

21. The TFR has shown a consistent decline over the rounds. It is seen that there has been a rise in female age at marriage; the median age at first marriage has increased and proportions never married have risen in younger ages at childbearing (Table 1). More impressive is the rise in contraceptive prevalence which had begun even before the NFHS rounds. In 1970, only about 10 per cent of the couples of reproductive ages were using any contraception (Operations Research Group, 1971). By the early 1990s (NFHS-1), over a third of the couples were using a modern contraceptive and 40 percent were using some contraception; the prevalence rate has risen further over time and during 2019-21 (NFHS-5) a majority of couples of reproductive ages were using a modern contraception and two-thirds were using some contraception. Clearly, fertility regulation within marriage is by now a common practice.

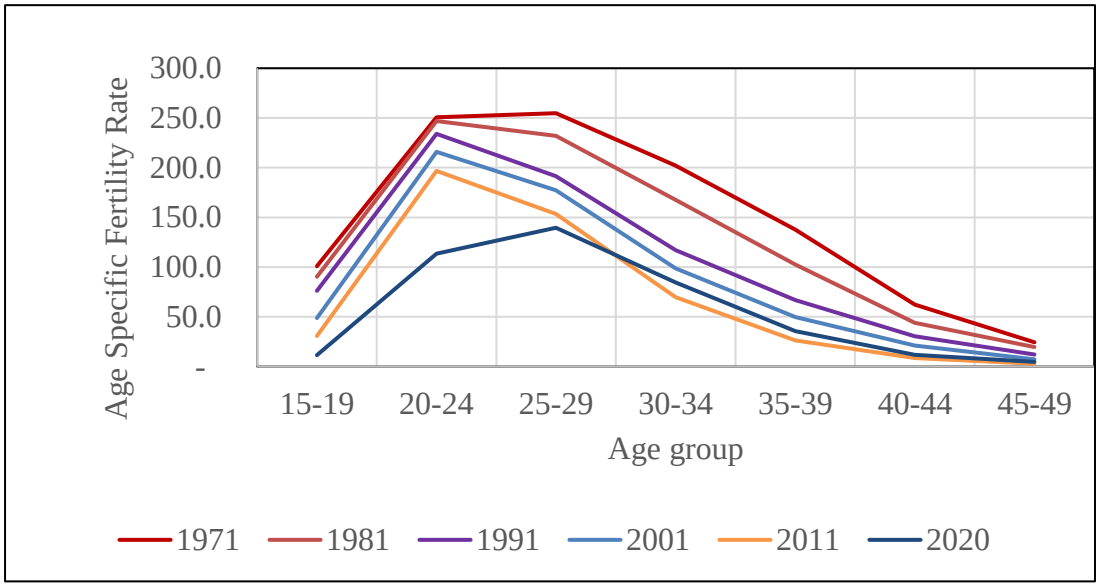

Fig. 2: Trends in Age-Specific Fertility Rates, India, from the Sample Registration System
Sources: Sample Registration System, Statistical Reports: Registrar General, India, (2019, 2022):

During the process of transition, the age pattern of fertility has changed; trends from the SRS over the period 1971 to 2020 are shown in Fig.2. Though fertility has declined at all ages, a steep fall is seen in the early childbearing ages (notably the 15-19 age group); this is attributable to a rise in the age at marriage. The older ages of childbearing (35 and above) also show a large decline. Since terminal methods (sterilization) dominate contraceptive prevalence in India, for many women childbearing stops well before the end of the reproductive span.

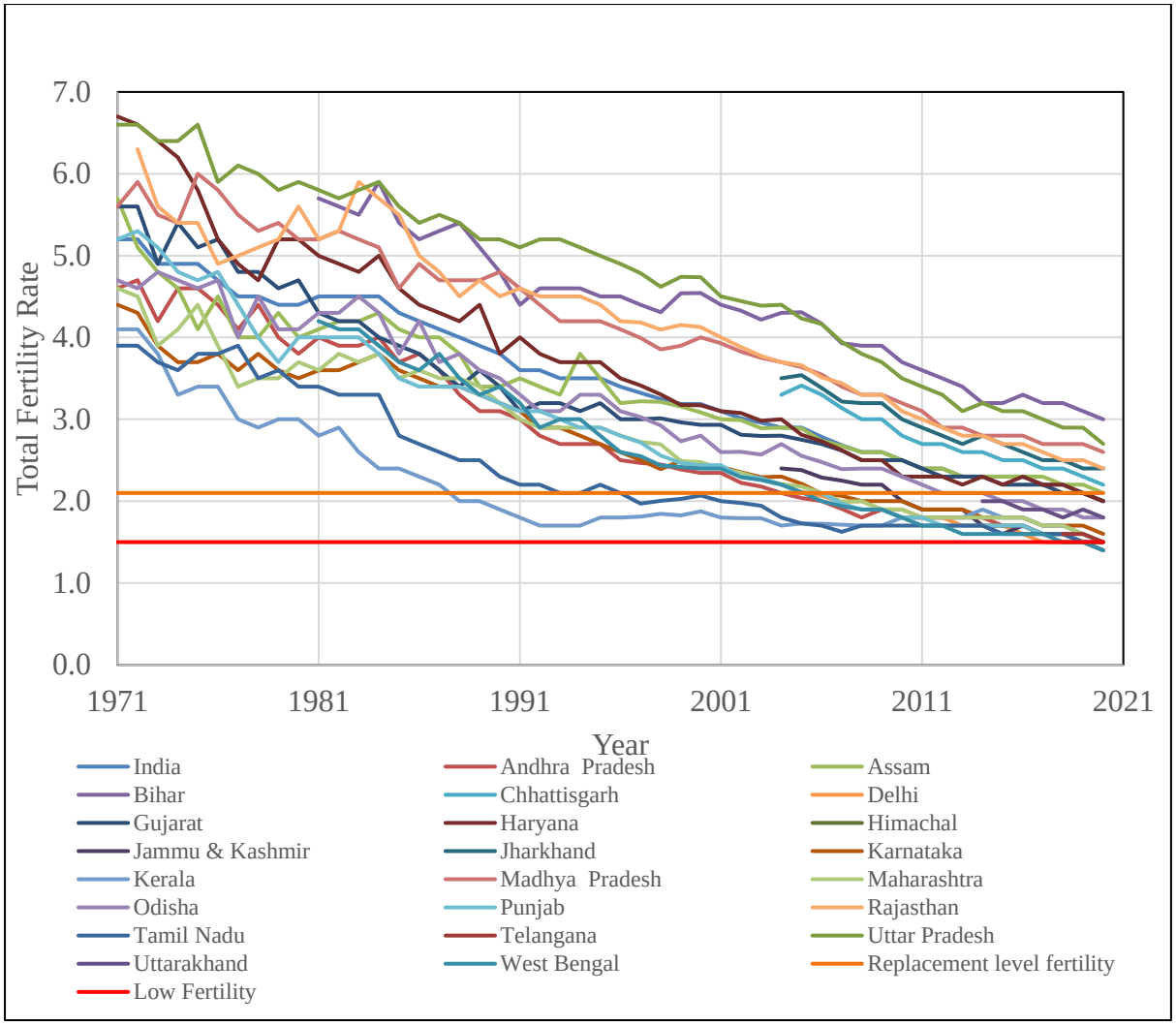

Figure 3: Recent Trends in Total Fertility Rate, 2001-2020, India and large states/union territories.
Note: Two horizontal lines show TFR = 2.1 (low replacement level fertility) and TFR = 1.5, low fertility.
Sources: Sample Registration System, Statistical Reports: Registrar General, India, (2019, 2020, 2021, 2022):

Though fertility has declined in all states of India, the timing and pace have varied (Figure 3). Kerala was the leader among large states and Goa among small states in fertility transition. Kerala achieved replacement fertility as early as 1988 followed by Tamil Nadu in 1996. Andhra Pradesh and Telangana, Punjab, West Bengal, Maharashtra, Karnataka, Jammu and Kashmir did so before 2011. By 2020, fertility in many other large states and most of the small states had also fallen to a low level; estimates from the NFHS fifth round (2019-21) and the SRS (for 2020) are nearly identical for most states (Table 2). In the remaining states, mostly in the north-central region, TFR has been declining and is projected to fall below replacement level soon. The table also presents Total Wanted Fertility Rate (TWFR), which indicates the level of fertility that would result if all unwanted births were prevented. The TWFR is lower than 2 in all states except Bihar and Meghalaya. Thus, transition to low fertility can be said to have been completed at the national level and in most parts of the country and is set to do so in the rest.

Table 2: Total Fertility Rate (TFR) and Total Wanted Fertility Rate (TWFR) for states of India, NFHS-5, 2019-21, and TFR, SRS (2020)

		NFHS-5 (2019-21)		SRS 2020
Region	State	TFR	TWFR	TFR
North	Delhi	1.6	1.3	1.4
	Haryana	1.9	1.5	2.0
	Himachal Pradesh	1.7	1.4	1.5
	Jammu & Kashmir	1.4	1.3	1.5
	Punjab	1.6	1.3	1.5
	Rajasthan	2.0	1.6	2.4
	Uttarakhand	1.8	1.5	1.8
Central	Chhattisgarh	1.8	1.6	2.2
	Madhya Pradesh	2.0	1.6	2.6
	Uttar Pradesh	2.3	1.8	2.7
East	Bihar	3.0	2.2	3.0
	Jharkhand	2.3	1.9	2.4
	Odisha	1.8	1.5	1.8
	West Bengal	1.6	1.4	1.4
Northeast	Arunachal Pradesh	1.8	1.5	1.9*
	Assam	1.9	1.6	2.1
	Manipur	2.2	2.0	1.5*
	Meghalaya	2.9	2.7	2.7*
	Mizoram	1.9	1.8	1.5*
	Nagaland	1.7	1.6	1.6*
	Sikkim	1.0	0.9	1.5*
	Tripura	1.7	1.5	1.3*
West	Goa	1.3	1.2	1.4*
	Gujarat	1.9	1.5	2.0
	Maharashtra	1.7	1.4	1.5
South	Andhra Pradesh	1.7	1.6	1.5
	Karnataka	1.7	1.4	1.6
	Kerala	1.8	1.7	1.5
	Tamil Nadu	1.8	1.6	1.4
	Telangana	1.7	1.6	1.5
India		2.0	1.6	2.0

*: These rates refer to 2013.

Note: Estimates for the union territories Delhi and Jammu & Kashmir are also included in the table.

Sources: NFHS-5: IIPS and ICF (2021); SRS: Registrar General (2019, 2022).

Moreover, some states now show very low fertility, with the TFR around 1.5, and some even lower than that. The low fertility has triggered a concern about long-term consequences.

Fertility has declined in all sections of the society. Estimates of TFR for various socioeconomic classes are presented in Table 3. For the sake of brevity, indicators from only the first, the third

and the fifth rounds of the NFHS (corresponding to 1992-93, 2005-06, and 2019-21 respectively) are shown. Though there are differentials, some on expected lines (relatively lower fertility among the more educated than the less educated and among those from the wealthier households than the poorer households), fertility was low in all classes in 2019-2020 (NFHS-5) and no group had TFR above 3. The differentials in the TWFR are narrower than in the TFR and in almost all socio-economic groups, the TWFR does not exceed 2. Thus, if effective fertility regulation could be adopted, fertility would be quite low in all sections of society.

What caused the fertility decline?

Fertility decline is part of the classical demographic transition. The demographic transition theory was developed based on the experience of the western, especially the European, world during the pre-World War II period (for a brief critical review, see Chesnais, e-book). Essentially, sustained decline in mortality is followed by a fall in fertility with fertility reaching a low level (in the past, fertility also declined on account of wars, famines, and displacements but these were short-term effects). Dyson (2010) calls mortality decline as the distal factor for fertility decline. Whereas mortality decline is attributed to improvements in nutrition, sanitation, hygiene, and medical advances, there are varied explanations of fertility decline.

Coale (1973) stated three conditions for fertility decline: fertility to be within the calculus of conscious choice, a small family considered advantageous, and efficient means of fertility regulation to be available. This, of course, assumes that fertility decisions are made by couples or women voluntarily. Once it is accepted that couples or women feel that whether and when to have children is up to them, that is, fertility is within the calculus of conscious choice, and have access to the means of fertility regulation, the issue of desired family size arises. A number of theories have been proposed to explain what shapes the family size desires. These include the influences of various social, cultural, and economic factors. This is not the place to review the theories or explanations - change and response, reversal of intergenerational wealth flows, quantity-quality trade-off, structural changes especially change in the mode of production, female roles and labour force participation, family planning programmes, ideational changes, diffusion, rise in aspirations for children, among others; Cleland and Wilson (1987) provide an excellent critique of the demand theories of fertility decline.

In the case of India, fertility decline was evident in some states by 1980 and various research studies have examined the causes for this. By then, the idea that fertility is a matter of choice seemed to have been widely accepted and there was awareness about ways to regulate fertility. Moreover, the government family planning programme provided various contraceptive methods free of cost and often with some small incentives. Thus, two of Coale's conditions were met. The analyses, hence, focused on explaining what caused changes in the desired family size, more specifically, what led to the desire for a small family. Caldwell *et al*. (1982), Zachariah (1984), Rao *et al*. (1986), Jejeebhoy and Kulkarni (1989), Srinivasan (1995), Kishor (1994), Das Gupta (1995), Basu and Amin (2000), Sekher *et al*. (2001), Guilmoto (2005), Krishnamoorthy *et al*. (2005), James and Subramaniam (2005), Paul and Kulkarni (2006), and Sahoo (2013) have analysed fertility declines in several states of India. The decline was attributed to a number of factors. These included land reforms, demand for non-farm employment, female education, social reforms, the family planning programme, rise in aspirations, change in tastes, diffusion of elite behaviour and aspirations for children; for an overview, see Kulkarni (2011).

Table 3. Total Fertility Rate (TFR) and Total Wanted Fertility Rate (TWFR), by background characteristics, NFHS-1 (1992-93), NFHS-3(2005-06), and NFHS-5 (2019-21)

Background characteristic	Category	NFHS-1		NFHS-3		NFHS-5	
		TFR	TWFR	TFR	TWFR	TFR	TWFR
Residence	Urban	2.7	2.1	2.1	1.6	1.6	1.4
	Rural	3.7	2.9	3.0	2.1	2.1	1.7
Schooling of woman	No schooling	4.0	3.2	3.6	2.4	2.8	2.2
	<5 years complete	3.0	2.3	2.5	1.8	2.3	1.8
	5-7 years complete	2.5*	2.0*	2.5	1.9	2.2	1.8
	8-9 years complete			2.2	1.7	2.1	1.8
	10-11 years complete	2.2$	1.8$	2.1	1.7	1.9	1.6
	12 or more years			1.8	1.6	1.8	1.6
Religion	Hindu	3.3	2.6	2.6	1.9	1.9	1.6
	Muslim	4.4	3.4	3.4	2.2	2.4	1.8
	Christian	2.9	2.4	2.3	1.9	1.9	1.7
	Sikh	2.4	1.8	2.0	1.5	1.6	1.4
	Buddhist/Neo-Buddhist	na	na	2.3	1.7	1.4	1.2
Caste/tribe	Scheduled caste	3.9	2.9	2.9	2.0	2.1	1.7
	Scheduled tribe	3.6	2.9	3.1	2.1	2.1	1.7
	Other backward classes	3.3#	2.6#	2.8	1.9	2.0	1.7
	Others			2.4	1.7	1.8	1.5
Wealth quintile	Lowest	na	na	3.9	2.4	2.6	2.0
	Second	na	na	3.2	2.1	2.1	1.7
	Middle	na	na	2.6	1.8	1.9	1.6
	Fourth	na	na	2.2	1.7	1.7	1.5
	Highest	na	na	1.8	1.5	1.6	1.4
All population		3.4	2.6	2.7	1.9	2.0	1.6

Source: IIPS (1995), IIPS and Macro International (2007), and IIPS and ICF (2021).
*: Including 8-9 years complete, $: Including 12 or more years, #: Including others.
na: Not available.

Most of the analyses tried to explain what led to the desire for a small family and, generally, this meant a two-child family. Various neo-Malthusian programmes, of the government or other organisations, promoted the two-child norm. This was in tune with replacement level fertility; at low mortality this is achieved at a TFR close to 2.1. Data from the NFHS show that most of the couples with two living children wish to stop at that and a desired size of two has become very common, if not universal, over the years. The percentage of couples with two children who want no more children has risen from about 60 percent in the 1990s (NFHS-1) to over 80 percent since 2005-06, as seen in NFHS-3, 4, 5 (Table 4). Mean ideal family size has declined from about 3 to 2 over the period. Thus, the two-child norm seems to have been widely accepted by now. But the TFR has fallen below 2 in many parts of the country recently, and strong evidence of many couples preferring one child has emerged. Over time, there has been a rise in the desire to stop at one child. Trends from the NFHS show that the percent of married women with one living child who desire no more children has risen from 14.3 in NFHS-1 (1992-93) to 30.9 in NFHS-5 (2019-21); see Table 4.

While stopping at two children has become very common and the tendency of stopping at one child has increased notably, not many desire not to have any child at all. Almost all of those who are yet to have a child want some children. The percentage of those with no child at survey who wanted no more children (that means, wished not to have any child at all) was minuscule in NFHS-1 and has remained small at about 5 percent in NFHS-5. Clearly, while preference for a one-child family has increased over the years substantially, voluntary childlessness is yet to find many takers. There does exist non-negligible childlessness in India but analysis of data from a large survey (DLHS-3) revealed that at higher reproductive ages, most of the childlessness was attributable to primary infertility (Unisa, 2010).

Table 4: Desire for no more children and Indicators of Fertility, India, NFHS-1 to NFHS-5

NFHS Round and Years	Percent of currently married women who want no more children by Number of living children at survey					Indicators of fertility/ideal family size		
	Two	One (any sex)	*Only one Son*	*Only one daughter*	None	Total Fertility Rate	Total Wanted Fertility rate	Mean Ideal Family Size
1 (1992-93)	59.7	14.3	18.6	*13.7*	2.7	3.39	2.6	2.9
2 (1998-99)	72.3	18.1	23.4	*17.1*	2.1	2.85	2.1	2.7
3 (2005-06)	83.2	27.7	36.3	*23.9*	2.8	2.68	1.9	2.3
4 (2015-16)	83.6	29.4	38.1	*20.7*	5.6	2.18	1.8	2.2
5 (2019-21)	85.8	30.9	39.5	21.8	5.4	1.99	1.6	2.1

Notes: Women who have been sterilized or whose husband has been sterilized are deemed to want no more children.
Sources: IIPS (1995), IIPS and ORC Macro (2000), IIPS and Macro International (2007), IIPS and ICF (2017), IIPS and ICF (2021).

Table 5: Desire for no more children among currently married women ages 15-49 by the number of living children at survey, NFHS-5, India and States

State/India	Percent of currently married women ages 15-49 who want no more children by				
	Number of living children at survey				
	None	One (any sex)	*One son*	*One daughter*	Two $
Delhi	4.3	35.2	*44.3*	*25.1*	90.8
Haryana	4.4	37.1	*50.9*	*17.1*	89.6
Himachal Pradesh	6.1	44.7	*58.7*	*25.1*	94.5
Jammu & Kashmir	4.9	10.0	*13.5*	*7.2*	59.7
Punjab	3.7	40.2	*53.8*	*19.3*	86.9
Rajasthan	2.9	19.3	*27.7*	*9.6*	84.7
Uttarakhand	4.9	26.9	*36.5*	*16.6*	86.6
Chhattisgarh	5.0	21.4	*27.8*	*15.2*	85.2
Madhya Pradesh	4.2	27.1	*39.4*	*13.6*	88.0
Uttar Pradesh	5.7	21.1	*29.7*	*13.0*	76.7
Bihar	4.2	14.4	*21.9*	*8.5*	69.3
Jharkhand	5.0	21.3	*26.9*	*16.0*	79.3
Odisha	7.1	41.0	*51.7*	*28.2*	89.5
West Bengal	7.0	43.6	*51.3*	*34.5*	90.5
Arunachal Pradesh	6.5	19.7	*25.8*	*13.9*	59.0
Assam	6.6	30.9	*36.5*	*25.0*	86.7
Manipur	2.0	12.8	*15.3*	*10.1*	60.1
Meghalaya	6.8	16.1	*17.5*	*14.9*	33.1
Mizoram	1.3	11.3	*13.1*	*9.7*	29.1
Nagaland	0.5	16.9	*26.2*	*10.0*	57.4
Sikkim	9.7	47.7	*50.1*	*44.8*	90.4
Tripura	6.2	49.2	*54.0*	*43.7*	91.7
Goa	4.0	34.4	*39.6*	*28.2*	84.9
Gujarat	7.5	37.0	*48.8*	*22.2*	85.7
Maharashtra	5.8	35.6	*44.3*	*25.3*	89.6
Andhra Pradesh	4.7	36.7	*41.7*	*32.1*	92.3
Karnataka	7.5	33.7	*40.9*	*27.2*	85.8
Kerala	2.0	24.6	*27.5*	*22.2*	82.9
Tamil Nadu	4.2	31.1	*35.2*	*27.2*	93.5
Telangana	5.7	28.9	*34.9*	*23.2*	90.1
India	5.4	30.9	*39.5*	*21.8*	85.8

$: Two children with any sex combination.

Notes: 1. Women who have been sterilized or whose husband has been sterilized are deemed to want no more children.

2. Estimates for the union territories Delhi and Jammu & Kashmir are included in the table.

Sources: IIPS and ICF (2021).

There are regional variations in the desire to stop at one child. As seen in NFHS-5, the level is quite high (over 40 percent) in Tripura, Sikkim, Himachal Pradesh, West Bengal, Punjab, and Odisha, and low (below 20 percent) in Jammu & Kashmir, Mizoram, Manipur, Meghalaya, Nagaland, and Rajasthan (Table 5). In the southern states, which were leaders in fertility decline, this demand is moderate. A clear son preference is also seen, with 39.5 percent of those with one son desiring no more children in contrast to 21.8 percent among those with one daughter. The degree of son preference is quite conspicuous in many states, especially in the northern-western region but not so in the southern states.

How to explain the increased preference for a one-child family?

There are some differentials in the desire to stop at one child by socioeconomic characteristics. Generally, the desire to stop at one child is higher in urban population than rural and rises with the level of wealth. Multivariate analysis of the data from the NFHS of India by Pradhan and Sekher (2014) found that one-child families are relatively higher among those with urban residence, high education, and employment as professionals after controlling for the effects of other relevant factors. Further, analyses for the state of West Bengal, and the city of Kolkata, which have very low fertility, showed that education of woman and white-collar employment raised the prevalence of one-child families (Pradhan and Sekher, 2012). Broadly, the factors that explain the prevalence of one-child families seem similar to those which explain overall low fertility. Are there other explanations?

In the context of Europe, especially Western-Northern Europe, the sustained low (sub-replacement) fertility that was seen in late twentieth century was called the Second Demographic Transition (SDT); the pioneering work on this was by van de Kaa and Lesthaghe (for overviews, see van de Kaa, 1987 and Lesthaghe, 2014). Marriage and childbearing were no longer considered necessary for fulfillment as values changed. Rise of higher order needs in the Maslowian sense meant that women and men could derive fulfillment in life from other pursuits ('post-materialism'). This led to non-marriage as well as voluntary childlessness within unions. Are these considerations pushing fertility further down, to sub-replacement level, in India or at least in some parts of India or some sections of the society? Or are the same factors which lowered fertility to near replacement level pushing it further below replacement level?

Some analysts have specifically examined whether the recent decline to sub-replacement fertility in India is attributable to the SDT. In an analysis of data from the India Human Development Survey (IHDS, 2004-05), Basu and Desai (2016) noted that declining marriage and rising age at childbearing did not play much role in the fertility decline. Further, voluntary childlessness, a prime factor in the SDT, was not seen to a notable extent. Instead, the choice of a small family, including one-child family, was driven by considerations of "aspirations for social mobility through advancement of one's children" (p. 20). They further pointed out that "the motives underlying the first demographic transition do not respect the arbitrary floor of a TFR of 2 that demographers have set up" (p.23).

As the emergence of preference for a one-child family was seen in urban West Bengal quite early, field investigations in West Bengal and particularly in Kolkata have examined the causes. Analysis of data from a survey of 600 couples carried out in 2014 in Kolkata identified desire for private (English medium) schooling for children as the most prominent factor influencing the desire to stop at one child, followed by desire for durable goods and women's employment (Ghosh, 2017). Focus group discussions and in-depth interviews which complemented the couple survey in the study supported the strong influence of aspirations for children, as seen through the desire for private school education, on the preference for a one-child family. The study explored whether attitudes of the couples are in tune with conditions conducive to the SDT and found little support for non-marriage and voluntary childlessness.

Another field investigation in Kolkata conducted in 2013 found that many couples change family size desires after the birth of the first child. In particular, many prefer to stop at one child even when the ideal family size is greater than that (Mukhopadhyay, 2017; Mukhopadhyay and Mondal, 2021). It was noted that decisions on childbearing are taken after each birth, sequentially, and there is change in the desired size over the family building process. The same survey elicited attitudes of unmarried women on marriage and childbearing. A vast majority were not in favour of childbearing outside marriage. However, for many, if not majority, marriage was not considered essential (Mukhopadhyay, 2022).

In rural West Bengal, aspirations of white-collar employment, and by implication, for high education, for children emerged as the prime factor inducing couples to stop childbearing at one or two children (Das *et al*. 2023). Reasons for stopping at one child did not differ from those for stopping at two (Das *et al*, 2024).

Discussion

While decline in Indian fertility from a high to a low level has long been studied, fall to sub-replacement level fertility is a recent phenomenon and seen in some parts and sections of India. Though the SDT was advanced as the prime factor behind sub-replacement fertility in western-northern Europe, for India, the SDT does not seem to be in operation, at least at this time. Voluntary childlessness is rare and marriage still largely desired though some signs of non-essentiality of marriage have been seen in a metropolis. On the other hand, various analyses show that essentially the factors which led to replacement level fertility also caused sub-replacement fertility in some parts of the country. Broadly, high aspirations for children, as reflected by the strong desire to send children to private (and English medium) schools in order that they get into good white-collar employment or professions means high expenditures and consequently lower family size desires. In an era of 'Child king' as labelled by Aries (1980), heavy investments are made in child quality. Social mobility is sought to be achieved through education of children and parents intend to invest in children's education. This is in line with both the intergenerational wealth flows and the quantity-quality trade-off explanations. It is pertinent to note here the observation of Sobotka (2008) that there were different pathways in which European countries reached sub-replacement fertility.

While the one-child norm was promoted by China after 1979 (this policy has now been dropped), it was never recommended by the programme in India, nor by non-governmental organizations, nor by social reformers. Generally, a two-child family norm was favoured and

continues to be so. This is in tune with the demographic goal of replacement level fertility as well as a 'common-sense' ideal. A direct question on ideal family size showed that the mean ideal size decreased from 2.9 in NFHS-1 to 2.3 in NFHS-3 and then only marginally to 2.1 by NFHS-5. But recent surveys in India have shown that a large number of couples are stopping at one child. Does an initial desire for a two-child family, following the societal norm, change to a one-child-or no-child family for many (though not for a majority)?

Data from the NFHS show that this is indeed true. The NFHS had asked a question: "If you could go back to the time when you did not have any children and could choose exactly the number of children to have in your whole life, how many would that be?" to women who had some children at survey (IIPS and ICF, 2021); women who had no children at survey were also asked a similar question with a slightly different wording. Simple tabulations for India and some states show that among women whose ideal family size (before they had any children) was two, almost all with two children planned to stop at that (two children). Moreover, among those who had only one child at the time of survey, 27 percent desired to stop childbearing at that stage, that is, at one child (Table 6) even though they desired two children initially. Obviously, for many women, there is change (decline) in the desired size after having one child. Thus, there seems to be some re-assessment of the conditions resulting in change in the desired size. This is seen less in Kerala, the state that led in the fertility transition. Son preference is seen very clearly in Punjab; the desire to stop after a son is much greater than after a daughter.

Table 6: Percent of currently married women among those with ideal family size of two who want no more children by number of living children by sex, NFHS-5, India and selected states

India/ State	No of living children (with sex composition) at survey							
	None	One			Two			
		Sex composition of living children						
		Any	One son	One daughter	Any	One son & one daughter	Two sons	Two daughters
India	4.3	26.2	29.8	21.7	91.8	94.6	94.0	74.9
West Bengal	6.1	29.7	33.6	25.2	92.7	94.6	93.7	84.4
Punjab	3.9	28.6	37.5	16.2	88.1	92.9	92.4	48.8
Kerala	1.4	19.9	20.9	18.9	94.6	94.8	94.8	94.2
Tamil Nadu	3.6	29.1	30.1	27.9	95.4	97.2	95.6	89.6

Source: Computed from data files of NFHS-5.

Clearly, fertility desires are not fixed and change over the process of family building. Namboodiri (1972) had theorized that the decisions on childbearing are made sequentially, and at each stage, that is, after each birth, the desires are reviewed. The evidence from the NFHS supports this. After a child is born, the parents get a clearer idea of the costs, monetary as well as of time input, of bringing up a child and many stop earlier than initially planned.

Moreover, as Basu and Desai (2016) have pointed out, as the desired size declines, there is no floor of two children. In fact, the basic Becker-Lewis formulation does not necessarily imply a family of at least two children. The utility equations (Becker and Lewis, 1973, eq. (1) and (2), p. S280) are:

$U = u(n,q,y)$ with the budget constraint $I = n.q.\pi + y.\pi_y$,

where n is the number of children, q is their quality, y is the rate of consumption of all other commodities, I is the full income, π the price of nq, and π_y is the price of y. In this, the number of children, n, can as well equal one. Therefore, the considerations that restrict the family size to two can also lead to a size of one. If the desired quality of children is very high, in relation to the budget constraint, the desired size can be very low and also be one. But does the formulation allow a desired size of zero (voluntary childlessness)? If there is no child, where is the question of quality? For the sake of argument, one may say that the desired quality is so high that even one child is not affordable, that is, $n < 1$. But this is a contentious matter.

Looking into the future:

Before closing, one could think of what lies ahead. At this stage, one can only speculate; making any long-term forecast is hazardous. First, fertility decline is in progress and given the experience of the regions in which fertility has already fallen below replacement level, this is likely to occur in other regions over time in the foreseeable future. The U.N. Population Prospects (2024 revision) for India project the TFR to fall to 1.69 in the Medium Variant and population beginning to decline in the 2060s after the momentum effect wears out. The exact dates and values are not material, but the trend is clear. If the fall in fertility is steeper than projected (it has been seen that many countries have reached TFR values of 1.2 and even lower), the decline in population size would naturally begin sooner.

What are the prospects for the size and structure of population? First, the positive byproduct of recent demographic change, the demographic dividend, is certain to get phased out soon. Second, the population has begun to age and according to the Medium Variant of the U.N. projections, the share of elderly is projected to rise to nearly 30 percent by the end of the century U.N., 2024). If TFR falls well below the Medium Variant value, this share would be even greater; a huge burden of old age dependency.

But a bigger worry is regarding the decline in population size. This is not just for India, but for most of the world. True that many countries, mostly in Africa, have not yet achieved the first transition, with fertility still quite high; but these too are expected to reach low fertility levels after some time. The issue then is of worldwide population decline. As is well known, if fertility stays below replacement level for a long time, the growth rate will become negative and in the deterministic framework, if a negative growth rate persists, the population size will certainly shrink and move towards extinction (exponential decay) over time. In the stochastic framework of the Galton-Watson process (‘extinction of surnames’), even if the expected number of offsprings (either male descendants of males or female descendants of females) is one, the line will eventually become extinct. Therefore, instead of population explosion which was a concern of the last century, attention is now drawn to the possibility of population extinction.

Many countries, in their own interest, have been making efforts to arrest the fall in fertility. These include providing child support, family support, and paid long maternity and paternity leave. In the past, some even gave awards to women who had many children and also attempted to ban contraception. But such strategies have failed to achieve much. Some European countries did show a small rise in fertility but this was not sustained and fertility has remained at sub-replacement level (Ram and Ram, 2025). Pro-natalist policies have had little success since couples and women did not find high fertility to be in their interest. At the other end, as was seen in India, the government family programme for lowering fertility, with the campaigns, incentives and free provision of contraception, made little impact until couples themselves found a small family to be *in their interest*. Does this mean that sub-replacement is here to stay and we are facing extinction in the long term, after a few generations?

But prophesying doom is unwarranted. The population bomb widely tossed around a few decades ago did not explode after all. What are the possibilities now? One, there could be changes in the social and economic situation in the future which will make couples feel that it is advantageous, that is, *in their interest,* to have two or more children. Or, many will opt for two or more children in *national or global interest* even when they feel that it is good for them to have just one child or no child at all. This would require that survival of the human species is seen as a higher order need in the Maslowian hierarchy and fertility to rise to replacement level or higher in response to this. The world would then see another demographic transition, say, the Third Demographic Transition.

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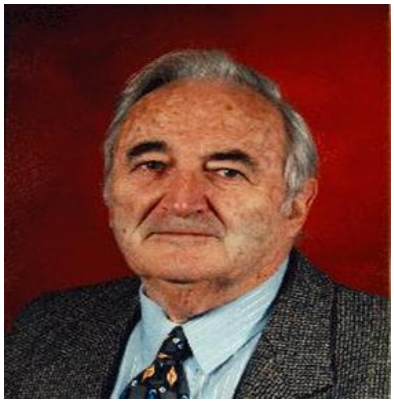
Professor John Caldwell



Professor John Caldwell's seminal work includes documentation of the role of mother's education in fertility limitation and child mortality decline and the role of circumcision in inhibiting the spread of HIV/AIDS in Africa. He is known for his "wealth flows" theory, which relates demographic transition theory to changes in intergenerational transfers within the family. A 2009 survey of nearly 1000 demographers worldwide named John Caldwell the most influential researcher of all time in the field of demography. In 1985, the Population Association of America (PAA) presented him with its highest prize, the Irene B. Taeuber Award for excellence in demographic research. In 1994, he began an elected four-year term as President of the International Union for the Scientific Study of Population (IUSSP). In 2004, he was presented with the prestigious United Nations Population Award. Dr. Caldwell's anthropological demographic work on South India, particularly on marriage and fertility, received a lot of research attention. He encouraged and mentored many scholars from India, and a good number of them received their Ph.D. from the Department of Demography at the Australian National University (ANU) under his able guidance. He passed away on 12th March 2016 in Canberra at the age of 87. Upon request from his students, colleagues and friends, the Indian Association for Social Sciences and Health (IASSH) instituted an annual memorial lecture in honour of Dr. Caldwell in 2016.

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