

Differentials in reproductive and child health status in India

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Abstract

Background: Inequalities in reproductive and child health (RCH) exist, in general, in different regions of India. The present study aims to investigate the current status of RCH and examine the factors responsible for it in different parts of India.

Methods: This study utilized data obtained from two Indian studies – (i) National Family Health Survey – 3 (NFHS- 2005-06) and (ii) District Level Household Survey (DLHS – 2002-04). Reproductive Health Index was computed on the basis of five variables such as total fertility rate, infant mortality rate, birth order, delivery care and female educational attainment.

Results: In terms of reproductive and child health, a wide range of variation exists in India in its different regions. The study reveals that among Indian states, 13 states have an index value less than the national average. On the basis of the reproductive health index, the Indian states can be divided into three categories, namely; progressive states, semi progressive states and backward states.

Conclusions: The interstate differences in healthcare utilization are partly due to variations in the implementation of maternal health care programs as well as differences in availability of and accessibility to healthcare between Indian states.

Key words: reproductive health, child health, maternal health care programs, India

Introduction

Health is not only a function of medical care but is also an integral part of the developmental process of the society. It is not possible to raise the health status and quality of life of people unless efforts to do so are integrated with wider efforts to promote overall well being of the society [1]. The main objectives of reproductive and child health (RCH) is to provide integrated and sustainable primary health care services to women in the reproductive age group and to young children, as well as putting a special focus on family planning and immunization. Health has to be seen as a basic need and an essential component of the quality of life. Some cultural practices widely prevalent in the area of health care, especially the care of the ill, are an indicator of this effort. Though important as the healthcare package is, so too is the healthcare delivery system. Health is not an isolate, nor is it isolatable. The key issues in the area of mother and child care hinge on the explicit and implicit assumptions regarding the status and roles of women in society [2].

Health inequity is an emerging issue all over the world. Some populations living in specific

geographic areas may have less access to basic health facilities. Inequalities in health may systematically put people at a disadvantage, as health is essential for overcoming the effects of other disadvantages because of socio-economic conditions. Inequity of health presents a major challenge to overcome for the achievement of the millennium development goals, particularly those related to maternal and child health, as existing programs are often not able to reach the most needy. Therefore, assessment of the coverage of disadvantaged populations under reproductive and child health programs should receive priority [3].

Disorders related to pregnancy and child birth are a major health issue in South-East Asia. They represent one of the biggest health risk differentials between the developed and developing world. The high rate of maternal, infant and child mortality in South East Asian countries has been associated with poverty, reduced education and literacy, lack of remunerative employment, low social status, and limited access to health services and family planning [4]. Estimates indicate that about 42 million pregnancies are voluntarily terminated every year at the global level, of which more



than 80 per cent occur in developing countries. Abortion has been one of the major reproductive health concerns in post-soviet nations, especially when it is commonly used as a means of fertility regulation. On average, every woman has had around 1.6 abortions in Kyrgyzstan [5].

Paradigm shifts have taken place in India's population policies from the earlier methods-mix target approach to the target free approach (TFA) in April 1996, subsequently renamed as the community's need assessment (CNA) approach in late 1997. These shifts have duly emphasized the RCH quality services package, which is geared towards an improvement in the quality of life, having implicit implications for a reduction in infant and maternal mortality. The utilization of RCH services and their linkages with basic demographic parameters and socioeconomic developmental factors, have often been analyzed and argued in the Indian perspective. The National Population Policy (NPP)-2000 also affirms the provision of quality RCH services and an informed choice of contraception along with women's empowerment characterized by improvements in women's educational standards, working conditions and autonomy. These improvements are expected to bring about changes in their quality of life, standard of living and to facilitate a faster control and an early stabilization of the population [6]. Every year in India, 2.4 million children and about 136,000 women die unnecessarily. These numbers represent about one fifth of the global total and only if a dramatic reduction in these avoidable losses is achieved, can India hope to reach the Millennium Development Goals on maternal and child mortality. India's National Rural Health Mission was launched in April 2005 with a strong commitment to reduce maternal and infant mortality and provide universal access to public health services. The second phase of India's Reproductive and Child Health Program (RCH II) is an integral and important component of this mission [7].

In developing countries, the use of modern health care, such as modern health services, can be influenced by the socio-demographic characteristics of women, the cultural context, and the accessibility to these services [8-10]. The pattern and determinants of maternal healthcare utilization across different social settings in South India was examined in the states of Andhra Pradesh, Karnataka, Kerala and Tamil Nadu. According to these studies, the utilization of maternal healthcare services is not only associated with a range of reproductive, socioeconomic, cultural and program factors but also with state and type

of health service. The interstate differences in utilization could be partly due to variations in the implementation of maternal health care programs as well as differences in availability and accessibility between the States. A comparative study was carried out on the reproductive and child health status of the scheduled castes and scheduled tribes of West Bengal on the basis of NFHS (National Family Health Survey) - I and NFHS - II data [11]. A similar attempt was also made considering the population of West Bengal [12]. Mandal et al's study [13] reveals that, in a district of West Bengal, the nutritional status of the subjects was unsatisfactory, indicating a major public health problem. There is scope for much improvement in the form of enhanced supplementary nutrition. One study, in a healthy Indian population, found that among adolescents, the parasympathetic activity was higher in females than in males during the rest period. Exercise induced sympathetic activity lasted longer in females with higher BMI and lower age, resulting in decreased heart rate variability [14]. In another study, the results revealed that Shabar tribal children from forest regions had the highest prevalence of undernutrition followed by their rural and urban counterparts. To reduce the prevalence and extent of undernutrition, it is essential to improve economic conditions and to simultaneously carry out measurements for reducing malaria specifically in forest habitats [15].

India is a country of numerous social, ethnic, religious and territorial groups, which, by and large, reside in villages, where poverty, illiteracy, ignorance and superstitions prevail in general. The situation of population, health and healthcare practices is therefore, not uniform throughout the country. In this study an attempt has been made to draw a composite picture of the present scenario of differentials in healthcare utilization relative to reproductive and child health in India.

Material and methods

For the sake of the present analysis, data were obtained mainly from two sources. These are:

1. National Family Health Survey [16] - 3 (NFHS-2005-06) and
2. District Level Household Survey [17] - (DLHS-2002-04)

Reproductive Health Index (RHI)

The Reproductive Health Index was computed which gives an insight of the reproductive health status in different states. The index is based on five variables - total fertility rate (TFR), infant mortality rate (IMR), birth order, delivery care and female educational attainment. At the first stage,

five separate indices were computed. The RHI was computed by giving equal weights to each of the five indices. The data source and detailed procedure for the computation of the RHI is given in Appendix 1.

Results

Reproductive Health indicators: in the preceding sections, some selective reproductive health indicators are discussed for the perspective of different Indian states (Figure 1).

Fertility

Total fertility rate (TFR) gives a direct measure of fertility rather than crude birth rate. Rates above two children mean that the population growing in size. Side by side, a rate of below two children means that the population is decreasing in size and growing older. TFR in India is declining in general, and is more pronounced in some states in particular. It can be seen from Table 1 that there exists a wide variation in TFR between different states of India. The state of Bihar with a TFR of 4, and Andhra Pradesh and Goa with a TFR of 1.79, show the highest and lowest rate respectively. Like Bihar, states like Meghalaya (3.80), Nagaland

(3.74), Jharkhand (3.31), Rajasthan (3.21), Madhya Pradesh (3.12) and Arunachal Pradesh (3.03) also show a high TFR. In turn, Tamil Nadu (1.80), Kerala (1.93), Himachal Pradesh (1.94), Punjab (1.99), Sikkim (2.02) and Karnataka (2.07) show a comparatively lower TFR. The other states show a value more or less similar to India's national average (2.68). However, overall fertility showed a declining trend all over India although some states still present high fertility rates indicating a slow pace of decline in fertility levels.

Infant mortality

Infant mortality rate (IMR) is a sensitive indicator of health status in any area is always found to be higher in India than in many other Asian Countries. Though IMR has substantially declined in India in the past years, it is still at an unacceptably high level and a lot more still needs to be done. Like fertility, in the case of infant mortality too, a wide range of variation was perceptible in different states of India. While states like Kerala (15.30), Goa (15.30), Manipur (29.70) and Tamil Nadu (30.40) achieved a low level, Uttar Pradesh (72.70), Chhattisgarh (70.80), Madhya Pradesh (69.50),

Figure 1. Map of India.

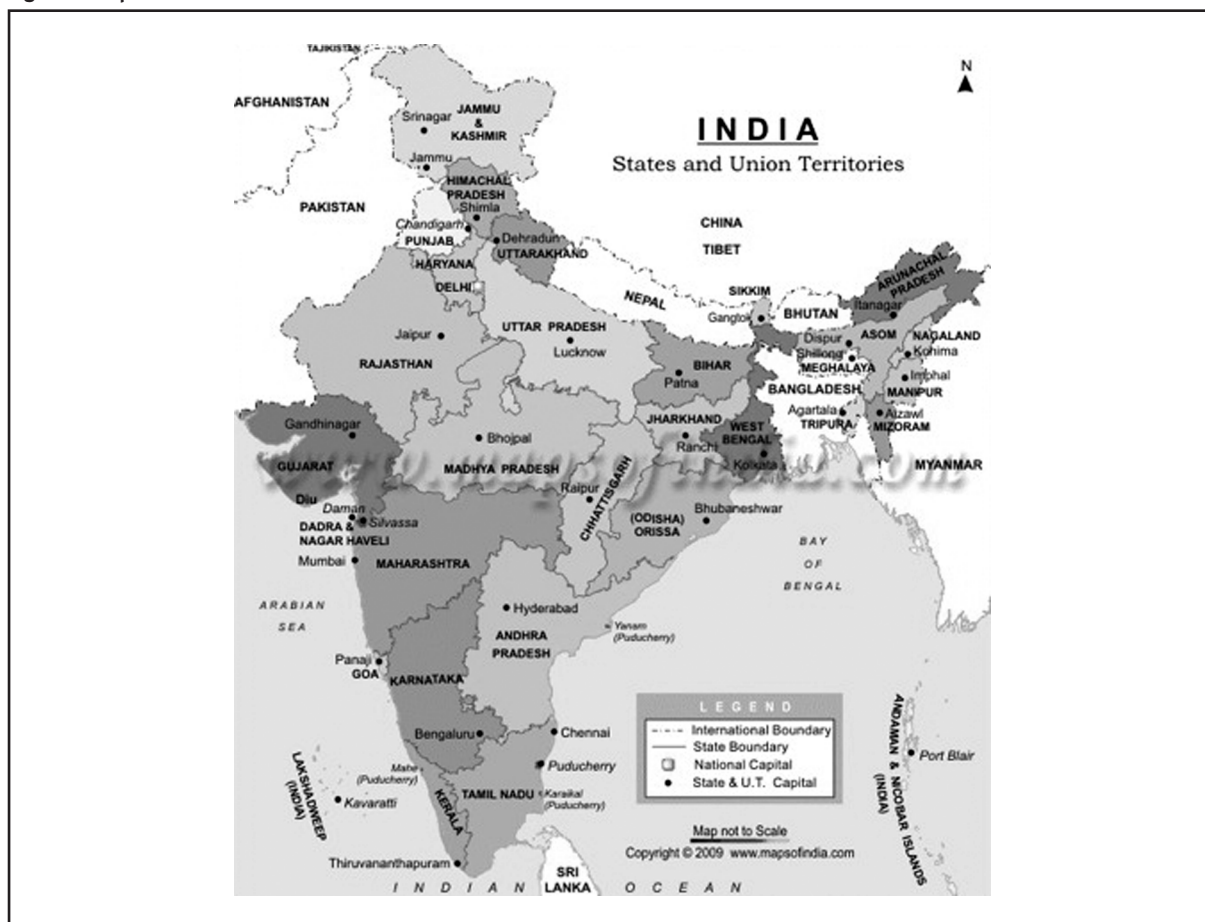


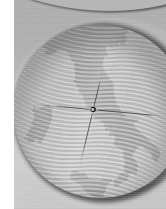
Table 1. Selected reproductive health indicators – Indian States.

State	Reproductive health indicators						
	Total fertility rate	Infant mortality rate	Birth Order (3+)	Type of delivery care		Female educational attainment	
				Institutional delivery	Delivery attended by trained personnel	Female literacy rate	Middle school enrolment ratio (girls)
Andhra Pradesh	1.79	53.50	22.50	22.10	69.00	50.40	46.37
Arunachal Pradesh	3.03	60.70	48.80	27.10	37.70	43.50	45.97
Assam	2.42	66.10	40.60	13.90	33.20	54.60	47.85
Bihar	4.00	61.70	54.40	5.40	29.50	33.10	34.91
Chhattisgarh	2.62	70.80	44.90	9.60	29.10	51.90	43.27
Delhi	2.13	39.80	42.20	29.50	59.90	74.50	46.71
Goa	1.79	15.30	20.00	40.00	93.30	75.40	47.19
Gujarat	2.42	49.70	38.10	12.70	62.10	57.80	42.07
Himachal Pradesh	1.94	36.10	24.40	36.90	51.40	67.40	47.41
Haryana	2.69	41.70	38.40	10.60	43.20	55.70	44.41
Jammu & Kashmir	2.38	44.70	32.10	55.90	73.10	43.00	43.18
Jharkhand	3.31	68.70	48.90	5.30	27.80	38.90	40.09
Karnataka	2.07	43.20	29.60	29.00	66.60	56.90	46.87
Kerala	1.93	15.30	15.50	40.50	98.30	87.70	47.69
Madhya Pradesh	3.12	69.50	49.40	17.60	35.50	50.30	39.52
Maharashtra	2.11	37.50	32.40	24.10	62.60	67.00	46.42
Manipur	2.83	29.70	43.10	37.20	57.80	60.50	48.59
Meghalaya	3.80	44.60	59.50	23.70	34.50	59.60	52.10
Mizoram	2.86	34.10	41.50	47.10	60.60	86.70	48.96
Nagaland	3.74	38.30	57.70	8.20	29.60	61.50	48.22
Orissa	2.37	64.70	42.10	25.60	43.50	50.50	44.63
Punjab	1.99	41.70	32.40	9.50	64.30	63.40	47.37
Rajasthan	3.21	65.30	47.40	19.40	44.40	43.90	34.50
Sikkim	2.02	33.70	30.50	53.40	61.90	60.40	51.53
Tamil Nadu	1.80	30.40	21.60	44.50	89.20	64.40	48.00
Tripura	2.22	51.50	17.90	57.40	65.10	64.90	47.39
Uttar Pradesh	3.82	72.70	56.90	8.50	28.70	42.20	41.24
Uttaranchal	2.55	41.90	45.90	10.70	32.50	59.60	46.53
West Bengal	2.27	48.00	31.00	34.30	54.10	59.60	46.74
INDIA	2.68	57.00	42.00	18.70	47.60	53.70	46.83

Source: NFHS-III (2007); DLHS (2004)

Assam (66.10) and Rajasthan (65.30) showed a very high level of IMR (Table 1). However, the situation is encouraging in some states like Sikkim (33.70), Mizoram (34.10), Himachal

Pradesh (36.10), Maharashtra (37.50), Nagaland (38.30) and Delhi (39.80). All these states showed a much lower level of IMR than the national average of India (57.00).



Birth order

It is generally accepted that IMR increases with birth order. This tendency is particularly marked among mothers under 20 and over 40 years of age. It can be observed from Table 1 that Kerala, with a frequency of 15.5 per cent, and Nagaland with 57.7 per cent, showed the lowest and highest occurrence of a 3+ birth order in India. States like Bihar (54.4 %), Uttar Pradesh (56.9 %), and Meghalaya (59.5 %) also showed very high occurrence. In Tripura (17.9 %), Goa (20.0 %), Tamil Nadu (21.6 %), Andhra Pradesh (22.5 %) and Himachal Pradesh (24.4 %) high order birth (3+) occurred with less frequency than India's national average (42.0 %).

Medical attention at birth

Safe motherhood is epitomized by safe delivery, which means either institutional delivery or delivery at home assisted by trained personnel. Delivery at home is only considered safe if assisted by a trained professional, for example a doctor or ANM, but not by a traditional birth attendant. It is seen from Table 1 that institutional delivery, as well as delivery attended by trained personnel, are both high in the states of Kerala, Goa, Tamil Nadu and Jammu and Kashmir and low in the states of Bihar, Chhattisgarh, Jharkhand, Orissa, Uttar Pradesh and Uttaranchal. Other states show a value more or less similar to national average.

Female literacy

Literacy is universally recognized as a social development indicator and is considered as a powerful instrument of social change. It is argued that literacy among women has far reaching consequences on their health seeking behaviour. Low level of literacy is a serious cause of concern among women and a serious developmental lag. A high rate of female literacy is recorded for the state of Kerala (87.7), Mizoram (86.7), Goa (75.4) and Delhi (74.5). However, the rate is strikingly low in Bihar (33.1), Jharkhand (38.9), Uttar Pradesh (42.2) and Rajasthan (43.9). Comparable to the national average (53.7), a more or less similar trend is perceptible in other Indian states (Table 1). The Ratio of middle school enrollment for girls is considerably low in the states of Rajasthan (34.50), Bihar (34.91) and Madhya Pradesh (39.52). The other states showed a trend in line with India's national average.

Reproductive Health Index

The Reproductive Health Index is a composite index constructed by taking into account five variables representing different aspects of reproductive health outcomes. These are (i)

total fertility rate, (ii) infant mortality rate, (iii) proportion of higher order births (BO 4+), (iv) type of delivery care - this has two components, proportion of institutional delivery and proportion of home delivery assisted by trained personnel and (v) female education attainment - this has two components, female adult literacy rate and middle school enrollment ratio among girls. Based on these five summary indices, a joint score obtained by averaging these indices, called RH index, was computed. Table 2 shows that the RH index value for India is 41.04. It is evident that among Indian states, 13 states have an index value less than India's RH index value. This suggests that there are factors affecting reproductive health outcome and the situation is grim in these states. Certain selected states, such as Uttar Pradesh (20.28) and Bihar (20.71) had the lowest index value whilst Kerala (77.11) had the highest index value. States like Goa (73.18), Tamil Nadu (68.70), Tripura (66.05), Himachal Pradesh (62.82), Sikkim (61.72), Andhra Pradesh (57.93), Karnataka (56.18), Jammu and Kashmir (55.35) and West Bengal (54.17) showed a higher RH index. Side by side, lower levels of this index were recorded in states like Jharkhand (26.81), Nagaland (29.10), Meghalaya (29.30), Madhya Pradesh (30.96), Rajasthan (31.94), Arunachal Pradesh (34.28) and Chhattisgarh (34.53). The remaining states like Assam (40.21), Uttaranchal (40.79), Orissa (41.33), Haryana (44.34) and Manipur (48.70) showed an index more or less similar to national average. However, the five summary indices do not strictly follow the trend reflected by RH index. As Table 2 is quite self explanatory it needs no further description.

Discussion

India's current picture with regard to literacy, health and sanitation is not encouraging. Regarding human development, India's relative rank among 177 countries has risen by only two positions from 128 in 1999 to 126 in 2004. The achievements that have been made so far have not met the population and health goals set by the government of India, and the changes have been considerably slower than in many other Asian countries such as China, Indonesia, Thailand, Malaysia, the Republic of Korea and Sri Lanka. Findings of the present study corroborate this.

The majority of India's population live in villages which depend mainly on agriculture. Though the rural economy of India is largely based on agriculture, the main economic source, the land, is generally owned by several middle and higher class caste groups. BIMARU is an acronym coined by taking the first letter of four Indian states: Bihar,

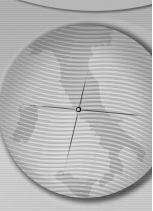
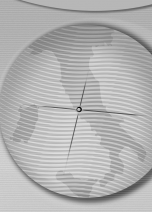


Table 2. Selective reproductive health indices – Indian States.

	Index of total fertility rate	Index of infant mortality rate	Index of birth order (3+)	Index of medical attention at birth	Index of female education attainment	Index of Reproductive Health
Andhra Pradesh	95.68	61.11	50.00	33.83	49.06	57.93
Arunachal Pradesh	67.50	54.96	25.14	29.75	44.32	34.28
Assam	81.36	50.34	1.71	18.73	52.35	40.21
Bihar	45.45	54.10	41.14	11.43	33.70	20.71
Chhattisgarh	76.82	46.32	14.00	14.48	49.02	34.53
Delhi	87.95	72.82	6.29	37.10	65.24	51.37
Goa	95.68	93.76	57.14	53.33	66.00	73.18
Gujarat	81.36	64.36	5.43	25.05	52.56	45.75
Himachal Pradesh	92.27	75.98	44.57	40.53	60.74	62.82
Haryana	75.23	71.20	4.57	18.75	51.94	44.34
Jammu & Kashmir	82.27	68.63	22.57	60.20	43.06	55.35
Jharkhand	61.14	48.12	25.43	10.93	39.30	26.81
Karnataka	89.32	69.91	29.71	38.40	53.56	56.18
Kerala	92.50	93.76	70.00	54.95	74.36	77.11
Madhya Pradesh	65.45	47.44	26.86	22.08	46.71	30.96
Maharashtra	88.41	74.79	21.71	33.73	60.14	55.75
Manipur	72.05	81.45	8.86	42.35	56.53	48.70
Meghalaya	50.00	68.72	55.71	26.40	57.10	29.30
Mizoram	71.36	77.69	4.29	50.48	74.12	53.87
Nagaland	51.36	74.10	50.57	13.55	57.07	29.10
Orissa	82.50	51.54	6.00	30.08	48.54	41.33
Punjab	91.14	71.20	21.71	23.20	58.06	53.06
Rajasthan	63.41	51.03	21.14	25.65	40.77	31.94
Sikkim	90.45	78.03	27.14	55.53	57.44	61.72
Tamil Nadu	95.45	80.85	52.57	55.68	58.93	68.70
Tripura	85.91	62.82	63.14	59.33	59.06	66.05
Uttar Pradesh	49.55	44.70	48.29	13.55	41.88	20.28
Uttaranchal	78.41	71.03	16.86	16.55	55.24	40.79
West Bengal	84.77	65.81	25.71	39.25	55.31	54.17
INDIA	75.45	58.12	5.71	25.93	51.41	41.04

Madhya Pradesh, Rajasthan, and Uttar Pradesh. It has recently been modified to include Orissa in the list, resulting in the acronym BIMAROU. The Economic analyst Ashish Bose coined the term. BIMARU resembles a Hindi word "Bimar" which means sick. He used this to describe the bad condition of economy in backward states like Bihar, Madhya Pradesh, Rajasthan,

and Uttar Pradesh. Later Orissa was included in the list. It should be noted that undernutrition is most pronounced in BIMARU states of India. Incidentally, these states are characterized by a low agricultural and gross domestic product (GDP) growth, low standard of living, high percentage of population below the poverty line and a high rate of infant and child mortality. Aside from



this, the prevalence of anaemia in women is also high in these states. Thus, there exists an inverse relationship between economic growth and health condition in the BIMARU states of India. Several studies, including those by the United Nations, showed that the performance of the BIMARU states adversely affected the GDP growth rate of India. There is a below average rating of all healthcare indices in the BIMARU states. Ongoing findings have confirmed a low rate of literacy, as well as low ratio of middle school enrolment for girls which appears to be pronounced in the BIMARU states of India.

The RCH interventions being implemented by the Government of India are expected to provide quality services and achieve multiple objectives. In this respect it can be mentioned that neither the figures related to RCH indicators, nor the training status of Medical Officers in District Hospitals in different states, are encouraging in our country. The findings of the present study indicate that institutional delivery, as well as delivery attended by trained personnel, are both considerably low in the states of Bihar, Chhattisgarh, Jharkhand, Orissa, Uttar Pradesh and Uttaranchal.

States like Kerala and Tamil Nadu have already reduced their birth rates and achieved the replacement level total fertility rate of 2.1. Some states like Bihar, Uttar Pradesh, Madhya Pradesh and Rajasthan continue to experience high rates of birth and fairly low levels of death rates and a significantly high level of TFR. On the other hand, states like Assam, Orissa and West Bengal have somewhat moderate birth and death rates and relatively moderate TFR. These three states are expected to reduce their TFR towards replacement level well before the country's TFR comes down to that level. Against this, Bihar is expected to reduce TFR to replacement level by 2039, Rajasthan by 2048, Madhya Pradesh by 2060 and Uttar Pradesh by 2100 [18]. According to the present study, the fertility performance of the Indian states shows a similar picture.

On the basis of the RH index, Indian states can be divided into three categories. These are:

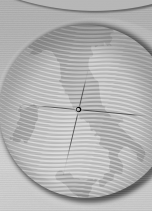
1. Progressive states: Kerala, Goa, Tamil Nadu, Tripura, Himachal Pradesh, Sikkim, Andhra Pradesh, Karnataka, Jammu and Kashmir and West Bengal.
2. Semi-progressive states: Assam, Uttaranchal, Orissa, Haryana and Manipur.
3. Backward states: Uttar Pradesh, Jharkhand, Madhya Pradesh, Chhattisgarh, Rajasthan, Meghalaya, Nagaland and Arunachal Pradesh.

Exploring preferences in relation to contraceptive use can increase the understanding of future reproductive behaviour and unmet family planning needs. This knowledge can help assist women meet their reproductive goals. Women who were younger, had fewer living children, had given birth in the past year and had regular access to health services were more likely to desire children. Women with regular access to health care are more likely to desire more children, probably because they are confident in their ability to have successful birth outcomes [19]. Women's autonomy in health-care decision-making is extremely important for better maternal and child health outcomes, and as an indicator of women's empowerment. In this connection, it can be mentioned here, may lie the key to improving overall health status of women and an effort should be made to improve women's level of educational attainment and increase their active participation in economic activities for better employment especially in the most backward states. This will help women to have more autonomy in decision making and to overcome the high rate of infant mortality and birth rate, perhaps. Thus, an attempt has to be made to reorient programs towards active female empowerment and change the attitude of the service providers at a grass root level, but also to strengthen the services at the outreach level. This in turn will help improve reproductive health throughout India.

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Appendix 1

$$\text{Index of TFR} = ((6-\text{TFR}) / (6-1.6)) * 100$$

$$\text{Index of IMR} = ((125-\text{IMR}) / (125-8)) * 100$$

$$\text{Index of Birth Order} = ((40\% \text{ of births of order } 4+) / (40-5)) * 100$$

$$\text{Index of Delivery Care} = ((3\% \text{ of institutional delivery}) + (\% \text{ of delivery attended by trained person})) / 4$$

$$\text{Index of Educational Attainment} = ((2 * \text{Female adult literacy rate}) + (\text{middle school enrolment ratio})) / 3$$