

P-ISSN: 2706-7483
 E-ISSN: 2706-7491
 IJGGE 2020; 2(2): 31-39
 Received: 05-05-2020
 Accepted: 08-08-2020

Dr. Sanjay Kumar Jha
 NET PhD, Geography, L N
 Mithila University,
 Darbhanga, Bihar, India

Population change in Bihar: Reasons and consequences

Dr. Sanjay Kumar Jha

Abstract

Human resource is the most important resource of a place but when population grows with a high speed then it becomes liabilities. The population of Bihar is growing very fastly and it is consider as population explosion.

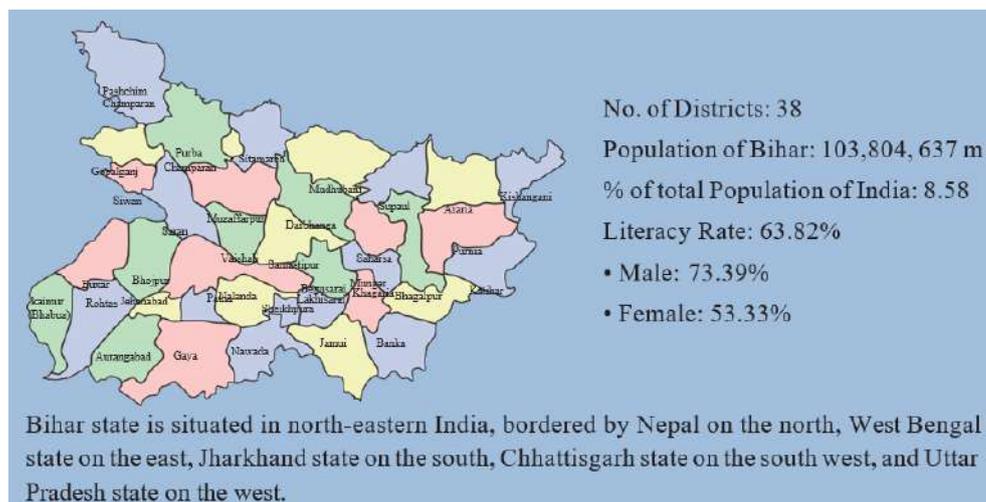
Keywords: population, census, birth rate, early marriage, growth rate, density of population, sex ratio

Introduction

The chapter describes the status of the population policies and family planning programmes in Bihar that would accelerate progress towards population stabilisation. It has largely relied upon the various secondary sources including government reports, policy papers related to health, population policy and programmes; literature review and desk research. However, information was also gathered about health, population and the reproductive health scenario in Bihar through discussions with different stakeholders like Government officials, Bihar State Health Society, Public Health Resource Network, Donor agencies, Non Governmental Organisations (NGOs) and individuals.

(Population and development profile of Bihar)

The state of Bihar is situated in the eastern part of India (Graph 3.1). About 2.97 per cent of India, it covers an area of 94,163 sq. km. As per the provisional population Census of India (2011) [3], 5 the State had a population of 103.8 million (males: 54.18 million and females: 49.62 million). The rural and urban population comprises 88.70 per cent and 11.30 per cent respectively implying a high population density at 1102 persons per sq. km compared to a national figure of 382 persons per sq. km (Provisional Census, 2011) [3]. In population, Bihar is the third largest state (having 8.58% population of India) next to Uttar Pradesh and Maharashtra (Census of India, 2011) [3]. The Sex Ratio in the State is 9166 as compared to 940 for the country, and the child sex ratio is 933 as compared to the national average of 944.



Map of Bihar

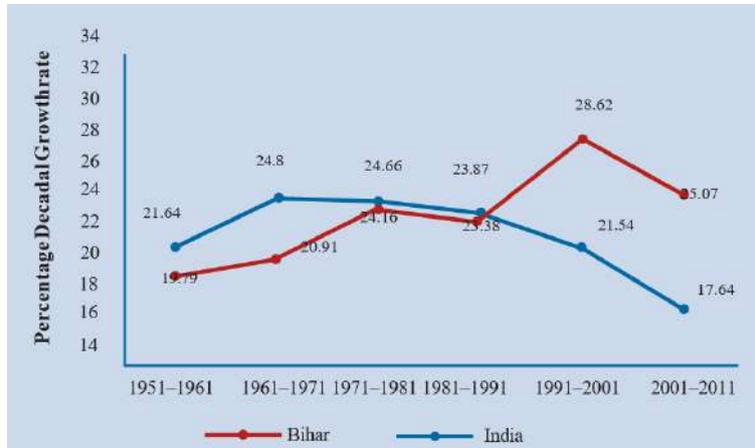
Corresponding Author:
Dr. Sanjay Kumar Jha
 NET PhD, Geography, L N
 Mithila University,
 Darbhanga, Bihar, India

The population in Bihar has been growing rapidly during the decade 2001–2011 at 25.07 per cent compared to India as a

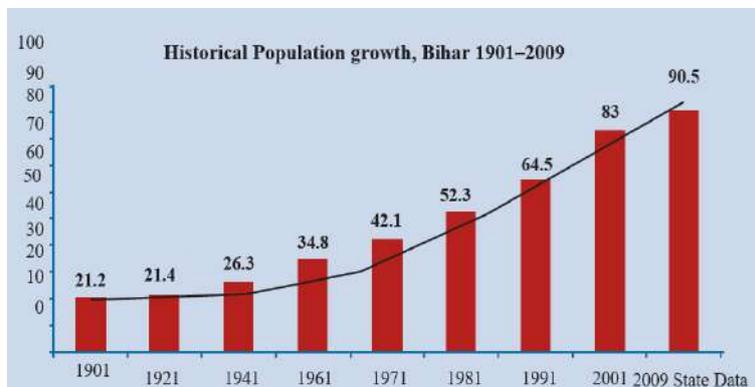
whole at 17.64 per cent (Table 2.1). The population nearly doubled in thirty years from 1981 to 2011 (Graph 3.3).

Table 3.1: Decadal Population Growth Rate

SL	India/ State	Percentage Decadal Growth Rate			Sex-Ratio (Females/1000 Males)			Population Density per sq. km.		
		1981–91	1991–01	2001–11	1991	2001	2001	1991	2001*	2011
1.	India	23.87	21.54	17.64	927	933	940	267	324	368
2.	Bihar	23.38	28.62	25.07	907	921	916	685	881	1102



Graph 3.2: Percentage decadal growth rate in Bihar



Graph 3.3: Historical population growth in Bihar

Demographic Diversity in India

According to a Report of the Technical Group on Population Projections for India and States 2001–2026, Census of India, 2001,7 the population of India is expected to increase from 1029 million to 1400 million during the period 2001–2026. This will be an increase of 36 per cent in 25 years at the rate of 1.2 per cent annually, while India’s population growth rate has been declining over the years. The overall population will continue to grow as 51 per cent of the population is in the reproductive age group (15–49 years). Millions more will join this cohort each year. The Group also estimated that under the current trends, it

would take at least 25 years for the use of contraception, female age at marriage, unmet need for contraception, ideal family size and regular exposure to mass media to reach respective levels required to attain replacement-level fertility in Bihar (Table 3.2). At current levels, it may take several more decades to stabilise the population. Considering the age structure and population distribution (according to Census 2011) [3] where 0–6 years constitutes the highest proportion (17.9 per cent) of the state’s total population, concentration of population in this age group also implies that the fertility transition in Bihar is much slower.

Table 3.2: Population Projection for Bihar, 2001–2026

State	Projected growth rate 2008–11 (%)	Projected population growth			Total fertility rate	
		% growth	(millions)	% share	2011	2021
Bihar	1.5	37.2	30.85	8.3	3.0	2.2
India	1.4	36.1	371.23	100.0	2.5	2.1

Out of the estimated total population increase of 371 million between 2001 and 2026 in India, 187 million are likely to be added in the seven States of Bihar, Chhattisgarh, Jharkhand, Madhya Pradesh, Rajasthan, Uttar Pradesh and

Uttaranchal,8 i.e., nearly 50 per cent of India’s demographic growth although they currently account for 40 per cent of the total population. Of the total population growth during the period 2001–26, it is estimated that Bihar would

continue to contribute to the current 8 per cent of its current share even then.

There is considerable demographic diversity in India (Table 3.3). While some states accounting for 61 per cent of the

total population have achieved or are close to achieving replacement level fertility, others with 39 per cent of the population will still take many more years.

Table 3.3: Estimated Dates for Reaching Replacement Fertility Level in Different States

States have already or nearly achieved replacement fertility	States that are expected to achieve replacement fertility by 2020	States that are expected to achieve replacement fertility after 2020
Kerala (1988) Tamil Nadu (2000)) Andhra Pradesh (2002) Himachal Pradesh (2002) Delhi (2001) NE States (2005) West Bengal (2003) Accounting for 28% of India’s population in 2001	Assam (2019) Jharkhand (2018) Haryana (2012) Orissa (2010) Gujarat (2012) Maharashtra (2009) Punjab (2006) Karnataka (2005) Accounting for 33% of India’s population in 2001	Uttar Pradesh (2027) Madhya Pradesh (2025) Chhattisgarh (2022) Uttarakhand (2022) Bihar (2021) Rajasthan (2021) Accounting for 39% of India’s population in 2001

Source: The Technical group on Population Projection, RGI. 2006.

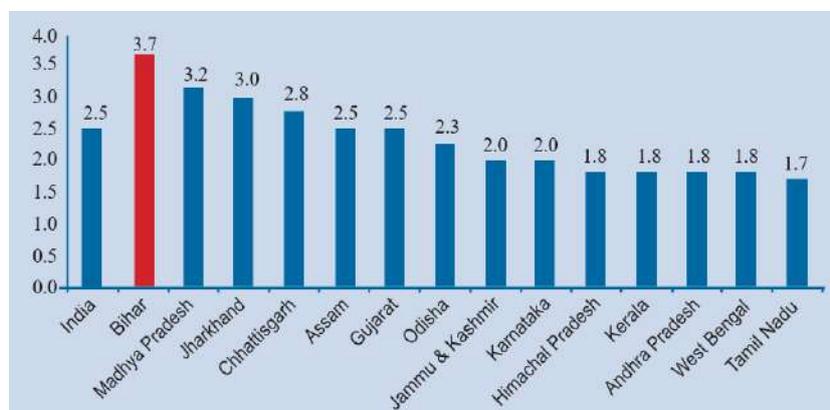
Socio-cultural Context of High Fertility

Bihar has a very high total fertility rate (3.7 children per woman according to SRS, 2010 estimates) in comparison to other states and country fertility rate (2.5 children per woman) (Graph 3.4). Except for the Infant Mortality Rate (IMR) which is only marginally higher in Bihar than in India, the demographic situation of Bihar is extremely

difficult. On the socio-economic front too, Bihar lags far behind the other states due to its high fertility, educational backwardness, and unemployment. Figures of major health and demographic indicators are given in Table 3.4. The IMR is 48 per 1000 live births (SRS, 2010) and Maternal Mortality Ratio (MMR) is 312 per 100,000 live births (SRS, 2004–06) which are higher than the National average.

Table 3.4: Demographic, Socio-economic and Health profile of Bihar as compared to India

S. No.	Item	Bihar	India
1	Total population (Census 2011) ^[3] (in millions)	103.8	1210.19
2	Decadal Growth (Census 2011) ^[3] (%)	25.07	17.64
3	Crude Birth Rate (SRS 2010)	28.1	22.1
4	Crude Death Rate (SRS 2010)	6.8	7.2
5	Total Fertility Rate (SRS 2010)	3.7	2.5
6	Infant Mortality Rate (SRS 2010)	48	47
7	Maternal Mortality Ratio (SRS 2004–2006)	312	254
8	Sex Ratio (Census 2011) ^[3]	916	940
9	Population below Poverty line (%)	42.60	26.10
10	Schedule Caste population (in millions)	15.07	166.64
11	Schedule Tribe population (in millions)	0.9	84.33
12	Female Literacy Rate (Census 2011) ^[3] (%)	53.33	65.46

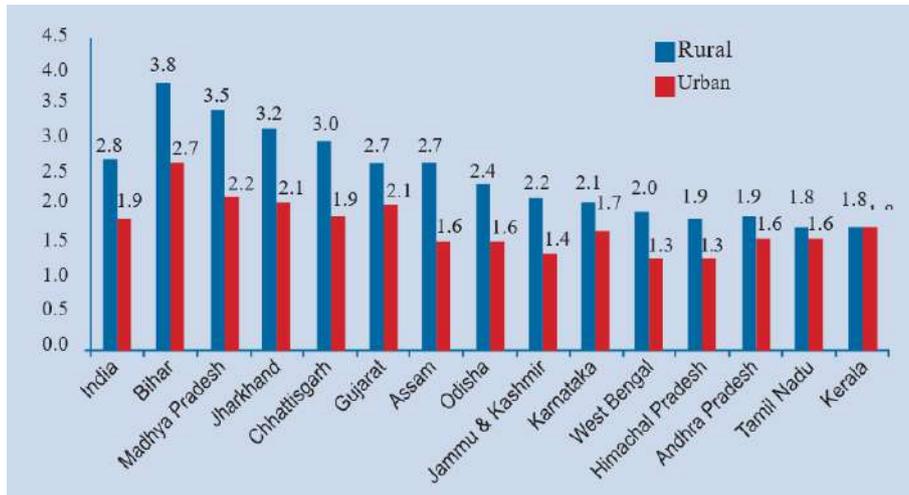


Source: Sample Registration System

Graph 3.4: Total Fertility Rate, India and major States, 2010

The state is predominantly rural with 88.70 per cent people living in rural areas (Provisional Census, 2011) ^[3]. It comprises 38 districts with 9 divisions, 101 sub divisions, 534 blocks, 199 towns and 44874 villages. All the districts have a rural population of over 80 per cent with 7 districts

having a rural population of over 95 per cent. Rural areas are socio-economically much less developed. In the rural areas of Bihar, fertility (3.7 children per woman) is higher in comparison to urban areas (2.7 children per woman) and is the highest in the country (Graph 3.5).



Source: Sample Registration System

Graph 3.5: Total Fertility Rate, India and major States, Rural and Urban, 2010

The data and indicators associated with high fertility in the State can be attributed to various factors. Prominent among them are:

- Economic backwardness.
- High percentage of marriages under the age of 18 years.
- Preference for male child.
- Low rate of female literacy and low female status.
- Modest level of infant mortality.

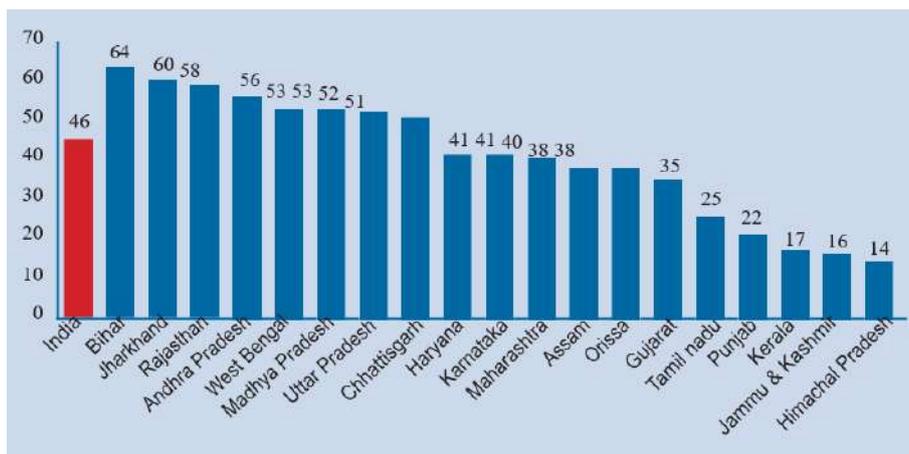
In addition, the family programme is weak resulting in lack of information and choices for safe family planning services and low level of contraceptive use.

Economic backwardness of the State can be judged from the fact that its per capita income is less than 40 per cent of the

national average and the rural poverty ratio is as high as 43.1 per cent compared to a national average of 27.1 per cent. The state is facing desperate challenges in improving its growth and health of its population, particularly that of women and children.

In Bihar, where female mean age at marriage is lower than the legal age, marriages are mostly early and arranged. Percentage of girls married below the legal age of 18 is 64 per cent (Graph 3.6) with the mean age of marriage for boys and girls being 21.6 and

17.6 years respectively (DLHS-III). This survey also shows that in Bihar out of total births, 8 per cent of births are to women aged 15–19 years.



Source: NFHS-3

Graph 3.6: Per cent of Women, Ages 18–29, Married by Age 18, Major States of India, 2005–06

The society places high emphasis on fertility with enormous social pressures, particularly on the youth, to bear children immediately after marriage. This is a serious concern in the state that needs to be immediately addressed (Table 3.5). In such a society and with such social pressure, many young people do not consider the possibility of delaying first child. However, some young people want to delay child bearing, but do not know how to do so. It is difficult for newly wed couples to translate intent into practice because of various

barriers in Bihar such as:

- Conventional thinking that women have no right to decide.
- No confidence to fight against societal norms.
- Lack of spousal communication.
- Inadequate knowledge of contraceptives and Reproductive Health (RH) services.
- Fear that contraceptive use can cause infertility.

Table 3.5: Fertility among youth

Fertility among youth	
Fertility in women under 25	55%
15–19 married	19%
15–24 want no more children	34%
Married 15–19 experienced pregnancy	58%
Median birth interval 15–29 months	25 to 29
Unmet need for spacing 15–24	35.1 to 26.7%
Spacing contraceptive use 15–24	3% to 16.7%

Source: NFHS 3 (2003–2005)

NFHS-3 results indicate that son preference in Bihar is strong. Thirty-nine per cent of women and men want more sons than daughters in Bihar. On the other hand, only 1–2 per cent want more daughters than sons. The vast majority of 88 per cent of women want at least one son and 85 per cent want at least one daughter. The desire for more children is strongly affected by the number of sons a woman has. Among women with two children, 68 per cent of women with one son and 77 per cent of women with two sons want no more children, compared with only 20 per cent of women with two daughters and no sons. In India, among women with two living children, 62 per cent of women with two daughters and no sons do not want any more children. More than half of the young boys and nearly three-fourth of the young girls are not enrolled in primary schools even today. The overall literacy rate in Bihar is only 63.82 per cent (male: 73.39, female: 53.33) as compared to 74.04 per cent for India and the disparity is even wider for female literacy with 53.33 per cent and 65.46 per cent for Bihar and India respectively.

The State indicators demonstrate substantially lower status of women in India. Only 22 per cent of the women reported making autonomous decisions about their own health care and 30 per cent reported having made decisions about the purchase of daily household needs (NFHS-3). Less than one in 10 women said that they could make the decision to visit their family or relatives.

Family Planning Status: Current Use and Unmet Need

The percentage of married women using contraception in India has increased from a level of just over 10 per cent in the early 1970s to 48 per cent in 1998–99, and to 53 per cent by 2004 (all India). Considering the logistical problems of

supplying information and services to more than 250 million women of reproductive age, this increase is a remarkable achievement. Surveys have repeatedly shown that women’s knowledge about contraception is nearly universal. Female sterilisation remains the most common method of family planning. As mentioned earlier, for the first time in recent decades, the 2001 Census has registered a fall in the growth rate of population below two per cent, indicating that the decline in the birth rate has begun to overtake the decline in the death rate. In the early 1970s, less than 15 per cent of the deliveries were occurring in institutions. It has increased from 12.1 per cent (1992–93) to 22 per cent (2005–06) to 27.7 per cent (2007–08) to 47.9 per cent (CES, 2008). This increase in institutional delivery since 2005–06 is largely due to the conditional cash transfer scheme (Janani Suraksha Yojana).

National Family Health Surveys (NFHS) surveys show that there was little change in contraceptive use for all methods between NFHS-1 (1992–93) and NFHS-2 (1998–99) in Bihar. However, contraceptive use for all methods increased from 23.5 per cent to 34.1 per cent by 2005–06 (Table 3.6). The unmet need declined from 25.7 per cent to 23.1 per cent showing that total demand for family planning had increased from 49.2 per cent to 57.2 per cent.

Nevertheless, contraceptive use in the state is characterised by the predominance of non-reversible methods, limited use of currently male/couple-dependent methods, substantial levels of discontinuation, negligible use of contraceptives among both married and unmarried adolescents and wide district level variations. Even per cent of currently married women (15–44 years) using female sterilisation is lower in Bihar in comparison to other states (Graph 3.9).

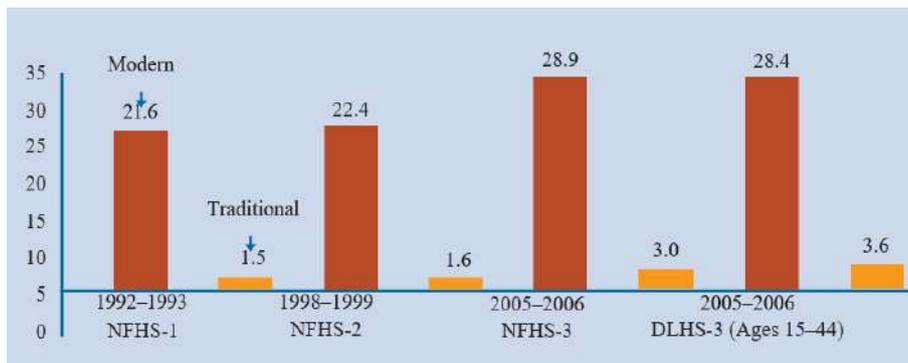
Table 3.6: Use of Family Planning Methods in Bihar

Key Indicators for Bihar from NFHS II and III	NFHS-3 (2005–06)			NFHS-2
	Total	Urban	Rural	(1998–99)3
Marriage and Fertility				
1. Women age 20–24 married by age 18(%)	60.3	37.3	65.2	71.9
2. Men age 25–29 married by age 21(%)	43.0	23.2	48.8	na
3. Total fertility rate (children per woman)	4.00	2.87	4.22	3.70
5. Median age at first birth for women age 25–49	18.7	19.6	18.6	18.9
Family Planning (currently married women, age 15–49)				
Current use				
7. Any method (%)	34.1	50.6	31.4	23.5
8. Any modern method (%)	28.8	41.2	26.8	21.6
8a. Female sterilisation (%)	23.8	31.2	22.6	18.5
8b. Male sterilization (%)	0.6	0.7	0.5	1.0
8c. IUD (%)	0.6	1.1	0.5	0.6
8d. Pill (%)	1.3	3.1	1.0	0.8
8e. Condom (%)	2.3	4.8	1.9	0.6
Unmet need for family planning				
9. Total unmet need (%)	23.1	17.4	24.0	25.7
9a. For spacing (%)	10.7	5.9	11.5	13.1
9b. For limiting (%)	12.4	11.5	12.5	12.5

na: not available, 3. NFHS-2 estimates recalculated to exclude Jharkhand.

The four surveys, NFHS 1–3 and District Level Health Surveys (DLHS) show that there is improvement in acceptance of modern methods of contraception. Family

planning, particularly sterilisation acceptance has increased in the state (Graph 3.7 and 3.8).



Source: NFHS-1, 2, 3, and DLHS-3

Graph 3.7: Contraceptive use by Currently Married Women, Ages 15–49 (Modern and Traditional Methods, Bihar, Four Surveys)

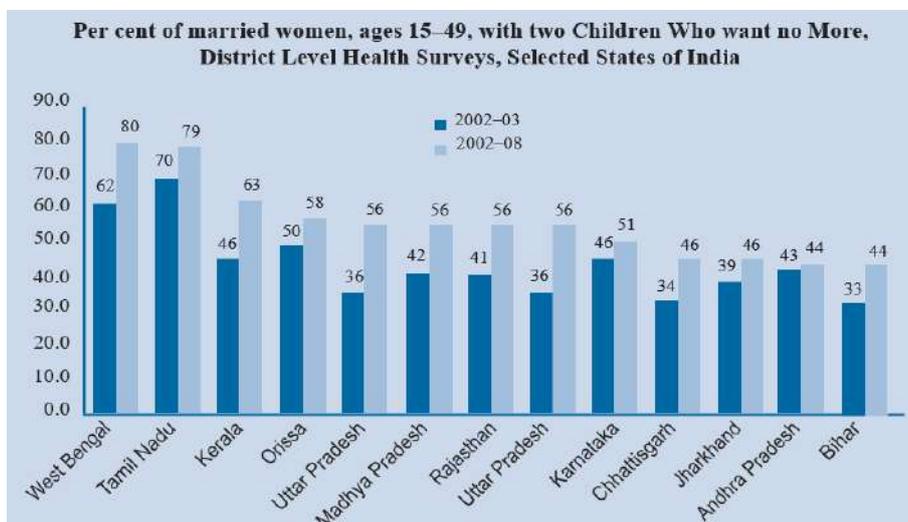


Source: DLHS-3

Graph 3.8: Per cent of Currently Married Women, Ages 15–44, Using Female Sterilisation and using other methods, Selected States of India, 2007–2008

Demand for children is higher in Bihar compared to India: percentage of married women with two children in the

reproductive age group wanting no more children in Bihar was 44 per cent, lower than all states (Graph 3.9).



Source: DLHS 1 and 3 (District Level Health Surveys, Selected States of India)

Graph 3.9: Per cent of married women, ages 15–49, with two children who want no more

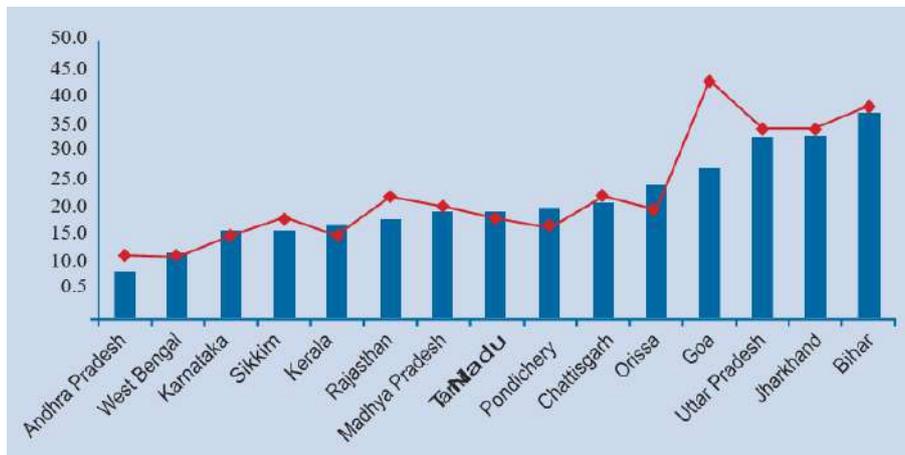
Meeting the unmet need for contraception

The National Population Policy document lays great stress

on meeting the unmet need for contraception as an instrument to achieve population stabilisation. The presence

of high level of unmet need for contraception for limiting of the family size and spacing between childbirths in Bihar state is validated by data from both NFHS and DLHS. It would be a mistake to assume that inadequate access to services should be the dominant, or even a major, explanatory factor for its presence. Total unmet need for family planning according to NFHS-3 (2005–06) was 23.1 and DLHS-3 (2007–08), using a different methodology estimated it to be 37.2 per cent (Graph 3.10). One in three to four women in the state had unmet need for family planning. Unmet need for limiting has increased in the state, which is a poor reflection of availability of services and service provisions, especially when majority of clients depend on public health services in the state. Total unmet need is

highest among the younger women and women of lower parity, particularly for spacing. It is important to address the unmet need for contraception, particularly for spacing by providing access to safe, effective and reversible methods. To do so it may be necessary to expand the basket of contraceptive choices. Social marketing of contraceptives and availability of the range of methods would help to meet the needs of couples who are not ready to accept sterilisation. Peripheral health workers, auxiliary nurse-midwives (ANMs) and Accredited Social Health Activists (ASHAs) should identify women with unmet need for contraception and address their concerns so that unwanted pregnancies could be avoided.



Graph 3.10: Unmet Need for Family Planning-Total

The increase in Contraceptive Prevalence Rate (CPR) in Bihar was nearly negligible during the period 1992–93 (NFHS-1) and 1997–98 (NFHS-2) as compared to 7.4 per cent increase in India (Table 3.7). However, increase in CPR was higher in Bihar compared to India during the period 1997–98 and 2005–06 with programme interventions discussed later.

Unmet need declined in India over time but not so in Bihar. Total demand for Family Planning (FP) is much higher in India compared to Bihar but it increased significantly between NFHS 2 and 3. Only 59.6 per cent demand is satisfied in Bihar compared to 81 per cent for India as a whole. Later in this section, reasons for high unmet need in Bihar are discussed.

Table 3.7: Contraceptive Prevalence and Unmet Need in India and Bihar

NFHS	Bihar			India		
	I*	II	III	I	II	III
Contraceptive prevalence rate	23.1	23.5	34.1	40.8	48.2	56.3
Unmet need	25.1	25.7	23.1	19.5	15.8	13.2
Total demand	48.2	49.2	57.2	60.3	64.0	69.5
% demand met	47.9	47.8	59.6	67.6	75.3	81.0

*For Bihar and Jharkhand together

Bihar is much poorer than India on the whole as can be seen by the proportion of households in different wealth quintiles (Table 3.8). As expected, Total Fertility Rate (TFR) decreases, CPR increases, unmet need decreases and per cent demand met increases as households become wealthier. However, it is very difficult to disentangle the effect of the socio-economic development and family planning programme on fertility. Bihar’s CPR is lower than India’s and TFR is higher than India’s for each wealth quintile. The total demand for FP in Bihar for each wealth quintile is also

lower than India. If the contraceptive use and fertility of persons in each wealth quintile household in Bihar was same as in India then wealth adjusted CPR and TFR for Bihar would be 52.8 and 3.07. If for each wealth quintile, the same proportion of FP demand was met in Bihar as in India, then the CPR would be 44.9; 10.8 per cent more than current CPR of 34.1 which is nearly half the difference between India’s and Bihar’s CPR. Similar is the situation with respect to education levels of women.

Table 3.8: TFR and CPR by Wealth Quintiles in India and Bihar

	Wealth quintiles					Total
	I	II	III	IV	V	
India (%)	20	20	20	20	20	100
Bihar (%)	31	30	18	13	9	100
Bihar CPR	21.5	28.4	38.1	48.0	60.4	34.1
India CPR	42.2	51.1	56.8	62.5	67.5	56.3
Bihar TFR	5.1	4.5	(3.6)	3.0	2.1	4.0
India TFR	3.89	3.17	2.5	2.24	1.78	2.68
Bihar unmet need	27.3	24.4	23.3	17.6	11.0	22.8
Bihar Total demand	48.8	52.9	61.4	65.6	71.4	56.9
India Unmet need	18.2	14.8	12.8	10.6	8.1	12.8
India Total demand	60.4	65.9	69.6	73.1	75.6	69.1
Bihar per cent demand satisfied	44.0	53.7	62.0	73.2	84.6	59.6
India per cent demand satisfied	69.9	77.6	81.6	85.4	89.3	81.5
Education levels of household population above 6 years of age						
	No education	< 5 years	5-7	8-9	10-11	12+
Bihar TFR	4.6	NA	3.2	3.2	2.4	2.4
India TFR	3.6	2.5	2.5	2.2	2.1	1.8
Bihar CPR %	29	40	41	41	53	53
India CPR %	52	63	59	59	60	62

High fertility is not just because women want much larger families (wanted TFR 2.8) but also because they are not able

to use appropriate contraception essential to achieve their wanted fertility (Table 3.9).

Table 3.9: Wanted fertility Rates by Wealth Quintiles in India and Bihar

	Wealth quintiles					Total
	I	II	III	IV	V	
Bihar TFR	5.1	4.5	3.6	3.0	2.1	4.0
India TFR	3.9	3.2	2.6	2.2	1.8	2.7
Bihar wanted TFR	2.8	2.7	2.1	2.1	1.7	2.4
India wanted TFR	2.4	2.1	1.8	1.7	1.5	1.9

This demonstrates that the wanted fertility is lower than current fertility and higher than replacement fertility, while the unmet need for contraception is high. Reasons for non-use of contraception in future for those with unmet need are related to fertility, opposition to use and FP method-related. It is both a supply problem in terms of access, availability and quality of care for family planning services and a demand problem because of opposition to use of contraception and gender inequalities which require

behavioural change communication and changes in socio-economic correlates of fertility (Table 3.10).

Conclusion

Rapid growth in population leads stress on existing resources. People of Bihar have low living standard. There is lack of jobs that force the people to migrate from the state in search of livelihood.

Table 3.10: Reasons for Non-use of Contraception

Reason for non-use	Bihar	India
Fertility related (infecund, breastfeeding, menopausal, etc.)	32	67
Opposition to use (self, husband, religious, social, etc.)	30	15
Method related (fear of side effects, cost and access, etc.)	27	12
Other	11	6
Total	100*	100*

*More than one reason was mentioned by respondents. Their responses have been adjusted to a total 100 per cent

References

1. Ashford LS. New Population Policies: Advancing Women’s Health and Rights, Population Bulletin, PRB 2001, 56(1).
2. Bulletin on Rural Health Statistics in India. Ministry of Health and Family Welfare, Government of India.
3. Provisional Census of India Government of India 2011.
4. Ahmad E. Bihar: A Physical, Economics and Regional Geography, Ranchi 1965.
5. (Late) Agrawala SN, Sinha UP. India Population Problems, Tata McGraw-Hill Publishing Company, Limited, New Delhi 1985, 58-59.
6. Agrawala SN. Population, National Book Trust, Bombay 1967, 61-67.
7. Axinn George H. The Role of Education in Rural Development, Stimulator or Oppressor in G. Singh and J.H. Dc Goedeeds, Rural Development Technology, An Integrated Approach Bangkok A.I.T 1977, 487-503.
8. Government of India. Central Calling, March, Department of Family Welfare 1978.
9. Yearbook Ministry of Health and Family Welfare 1982, 1980-81.
10. India. Publication Division. Ministry of Information and Broadcasting, Government of India 2009.
11. International Institute for Population Sciences (IIPS), Mumbai & ORC Macro. National Family Health

- Survey (NFHS-III) 2006, 2005-2006.
12. International Institute for Population Sciences (IIPS), Mumbai. Reproductive and Child Health- District Level Household Survey (RCH-DLHS) 2006, 2006-2008.
 13. International Institute for Population Sciences (IIPS) & Population Council. Youth in India: Situation and Needs 2006-2007, Executive Summary, Bihar. Mumbai: IIPS 2009.
 14. International Institute for Population Sciences (IIPS) & Population Council. Youth in India: Situation and Needs 2006-2007, Key Indicators, Bihar. Mumbai: IIPS 2008.
 15. Jejeebhoy SJ. Sexual and Reproductive Health among Youth in Bihar and Jharkhand: An Overview, *Economic and Political Weekly* 2007; 42(48):34-39.
 16. Ministry of Health and Family Welfare. Implementation Guide on RCH II: Adolescent Reproductive Sexual health Strategy for State and District Programme Managers, Government of India, viewed 21 August 2006-2012.
 17. <<http://india.unfpa.org/drive/ImplementationGuideFinal-RCH2ARSH.pdf>>.
 18. Population Council. Shaping Demand and Practices to Improve Family Health Outcomes in Bihar: Final Survey Report, Edited by ME Khan, France Donnay, Usha Kiran Tarigopula and Kumudha Aruldas 2012.
 19. Population, Health and Social Development in Bihar, Jharkhand, Orissa and West Bengal, Population Foundation of India, New Delhi 2010.
 20. Population Stabilization for the Eleventh Five Year Plan. Planning Commission, Government of India 2007-2012.
 21. Registrar General of India. Sample Registration System, SRS Bulletin 2011, 46(1).
 22. Report of the working group on population stabilisation for the Eleventh Five Year Plan, Planning Commission. Government of India, New Delhi 2007-2012.
 23. Wadia AB. The Family Planning Programme in India: The Non-governmental Sector the *Journal of Family Welfare* 1984, 30(4).