

# Contemporary issues pertaining to the status of health in Bihar in India

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## Abstract

**Objective:** The study captures the health status of population in Bihar in India and the changes therein using some health indicators.

**Methods:** There has been persistent drive to improve health outcomes by improving health infrastructure and other facilities in Bihar. However, a lot needs to be done in this direction. The status of health outcomes is closely related with socio-economic factors.

**Findings:** A low level of income promotes more number of children and compromises with the quality of nutrition and health. Similarly literacy level determines the extent of health facilities being availed by the masses and also the fertility level and effective age of marriage.

**Application:** The study focuses on the different factors affecting the health outcomes in Bihar.

**Keywords:** Health status, Literacy, Health infrastructure, Bihar, India.

## 1. Introduction

Human capital development has been at the core of development economics with focus on issues of health and education. Health indicators reflect the status of health of the population and serve as targets for the public authorities. The government aims at improving public health facilities with the goal of enhancing the health outcomes. This becomes important in the light of the fact that improved health and reduced morbidity improves productivity of labour force and avoids unproductive expenditure on medicine and treatment. Again maternal health is all the very important as it affects the health of the child who constitute the future of the country's labour force. Despite improvement in the health indicators like life expectancy and mortality rates the state still suffers from malnutrition and disease. Again the dismal performance on the front of provision of safe drinking water and better sanitation affects the hygiene and health of its population. Although the allocation for water supply and sanitation schemes and its utilization in the recent years has improved but is not enough. Different health indicators have been traced in the present paper in an attempt to explain the status of health in Bihar.

## 2. Literature Survey

Poor health adversely affects productivity of human capital and hence the process of development. It has been found that poor health adversely affects productivity of human capital and hence the process of development [1].

As discovered in case of rural South India that nutritional status is an important determinant of labour productivity [2]. It has also been found in a study based on England suggests that improvements in nutrition and health has affected economic growth positively in England over the last 200 years [3]. Health is also considered as an investment in human capital and there are studies which take into account the interaction of different factors like health, nutrition and education and their impact on wages [4].

Again different factors affect the health status of an individual. Apart nutrition factors like provision of safe and clean drinking water, proper sanitation proximity to factory or mine, way of life of people, nature of occupation, awareness among pregnant women and lactating mothers as well as their literacy level affect the mortality and morbidity rate in the country at the macro level.

### 3. Methodology

This study explores the issue of health in Bihar in India using secondary data taken from various sources. Data on various indicators of health like mortality rates both child and maternal, birth and death rates, fertility rates and status of immunization of children have been taken and the trend has been analysed by building logical analysis using data on some of the factors which have an impact on the status of health like public expenditure in health sector, Gross State Domestic Product (GSDP), literacy rates and Workforce Participation Rate (WPR). Data has been taken from various sources like different issues/ rounds of Bihar Economic Surveys, Census Reports, National Sample Survey Reports, National Family Health Survey Reports and Health and Family Welfare Statistics Reports (Ministry of Health and Family Welfare) and Sample Registration System Publications (SRS) (Registrar General of India).

### 4. Analysis and Discussion

The study throws light on the status of health in the state of Bihar with special focus on its rural population. In the past decade Bihar has seen rapid rate of economic growth. A large section of its population is dependent on agriculture. At present the primary sector contributes 21% to its GSDP while secondary and tertiary sectors have a share of 18 and 61% respectively in the GSDP. The composition of GSDP has seen a transition over the years with a major shift from primary to tertiary sector, the primary sector witnessing a decline while tertiary sector covering the lion share in income. However it remains to be seen how this increase in the rate of growth of income has translated into improved state of wellbeing. The study explores one of the aspects taking various health indicators and how have they behaved in the recent years as shown in Table 1.

Table 1. Sectoral composition of GSDP (At constant 1993-94 prices)

Year	Primary Sector	Secondary sector	Tertiary Sector
2004-05	42	9.02	48.98
2016-17(Q)	21	18	61

Source: Bihar Economic Survey various issues

#### 1. Trends in mortality indicators in Bihar

Since the study focuses on rural population the indicators of health status have been chosen accordingly. The Infant Mortality Rate (IMR) and Maternal Mortality Rate (MMR) are two indicators which reflect the state of wellbeing of the child and female population of any state. An improved rate is indicative of the fact that medical facilities are in place, there are provisions of immunization of both child as well as the mother, there are facilities of institutional deliveries and other post-delivery provisions and arrangements and people have started availing those facilities.

Table 2. Trends in Infant Mortality Rate (IMR) in Bihar

Year	IMR		
	Rural	Urban	Total
2002	62	50	61
2003	62	49	60
2004	63	47	61
2005	62	49	60
2006	62	45	60
2007	59	44	58
2008	57	42	56
2009	53	40	52
2010	49	38	48
2011	45	34	44
2012	44	34	43
2013	42	33	42
2014	43	37	42
2015	42	44	42

Source: SRS Publications, Registrar General of India, Various issues

The trend in IMR reflects that there has been a continuous decline in the rate since 2002. The rate has fallen for both urban as well as rural population. However the rural rates are higher than that of urban population and the difference is large. There has been around 34% decline in IMR of rural population in Bihar which is less than the decline for urban population.

As compared with the national average for the year 2015 the rate is 41% for rural population, 25% for urban population and 37% for total population each of which is lower than the rates for the state across all categories. Thus, the progress in rural Bihar has been slower as compared to the urban counterpart Table 2. Similarly, the Maternal Mortality Rate has declined over the years continuously and the fall has been remarkable in the past sixteen years. But compared with the national average Bihar still lags considerably and needs to work on this front as shown in Table 3.

*Table 3. Trends in Maternal Mortality Rate (MMR) in Bihar*

MMR	2001-03	2004-06	2007-09	2010-12	2011-13	2014-16
Bihar	371	312	261	219	208	165
India	301	254	212	178	167	130

*Source: SRS Publications, Registrar General of India, various issues*

One of the factors which can have an impact on the mortality indicators is the amount of allocation the state makes for health. Expenditure on health is considered as an investment capable of giving returns both private as well as social. There has been increase in the amount of public expenditure on health in Bihar as can be seen from Table 4. The percentage increase in the amount of real public expenditure from 2002-03 to 2015-16 is more than 500%. Although a large portion of this might be due to increase in state population and hence its requirement, still it represents a fair amount of increase.

*Table 4. Trends in health expenditure in Bihar*

Year	Expenditure in real terms
2002-03	342.92
2003-04	306.42
2004-05	335.82
2005-06	518.57
2006-07	552.59
2007-08	635.09
2008-09	547.03
2009-10	615.53
2010-11	621.08
2011-12	726.80
2012-13	1197.66
2013-14	1221.57
2014-15	1689.36
2015-16	2224.67

*Source: Bihar Economic Survey various issues*

## 2. Trends in Birth rate and Death rate in Bihar

Trends in birth rate and death rate show that there indeed has been a decline in both birth rate as well as death rate over the years in rural as well as urban areas of Bihar. The overall decline in birth rate has been 13% between 2002 and 2016 as can be seen from Table 5. However, the birth rate has remained higher in rural areas than in urban areas. Similarly in case of death rate there has been a decline of 24% between 2002 and 2016. The death rates also remain higher for rural areas than for urban areas. The decline in birth rate can be attributed to reduced poverty, improved literacy, greater participation of females in the job industry and increase in the effective age of marriage and reduced fertility to mention a few. In case of rural Bihar poverty has declined from 44.3% in 1999-00 to 33.74% in 2011. Poverty is one of the reasons for families to bear greater number of children as more children means more hands to work and hence greater earnings. The poverty ratio for urban areas was 32.9% and the overall poverty ratio was 42.6% in 1999-00. This overall poverty has declined to 33.74% as per census 2011.

Table 5. Trends in Birth Rate and Death Rate in Bihar

Year	Birth Rate			Death Rate		
	Total	Rural	Urban	Total	Rural	Urban
2002	30.9	31.8	23.5	7.9	8.2	6.1
2003	30.7	31.6	23.4	7.9	8.1	6.0
2004	30.2	31.0	23.1	8.1	8.3	5.7
2005	30.7	31.6	23.4	7.9	8.1	6.0
2006	29.9	30.7	23.0	7.7	7.8	6.3
2007	29.4	30.2	22.9	7.5	7.6	6.2
2008	28.9	29.7	22.5	7.3	7.4	6.0
2009	28.5	29.3	22.2	7.0	7.2	5.8
2010	28.1	28.8	22.0	6.8	7.0	5.6
2011	27.7	28.4	21.7	6.7	6.9	5.5
2012	27.7	28.4	21.6	6.6	6.7	5.5
2013	27.6	28.3	21.5	6.6	6.7	5.5
2014	25.9	26.9	19.9	6.2	6.4	5.2
2015	26.3	27.1	20.6	6.2	6.3	5.1
2016	26.8	27.7	21.1	6.0	6.1	5.5

Source: Health And Family Welfare Statistics in India, Ministry of Health and Family Welfare various issues

### 3. State of education in Bihar

The state has witnessed improvement in literacy levels overall as well as rural and urban. The literacy rate has increased from 47% in 2001 to 61.8% in 2011. While rural literacy has increased from 44% in 2001 to 60 percent in 2011 and urban literacy has increased from 72% to 77% in 2011.

However attendance at school is an issue in Bihar. Table 6 reveals that attendance at school declines with age and is lowest in case of rural females. The females in rural Bihar not only enrol in lesser number in schools but also drop out early from school. This explains to an extent the relatively higher birth rate in rural Bihar as compared to urban areas.

Table 6. Percentage of de facto household population age 6-17 years attending school in the 2014-15 school years by sex and residence, according to selected background characteristics, Bihar, 2015-16

Background Characteristics	Male			Female			Total		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
Age									
6-10 years	92.4	90.7	90.9	91.7	90.7	90.8	92.1	90.7	90.9
6-13	90.8	90.0	90.1	91.8	89.5	89.8	91.3	89.7	89.9
11-13	88.3	88.6	88.5	92.0	87.5	88.0	90.1	88.0	88.3
14-15	79.0	79.0	79.0	84.8	73.9	75.3	81.9	76.3	77.1
16-17	72.7	63.9	65.4	65.7	50.9	52.8	69.5	57.0	58.8

Source: National Family Health Survey -4 report

### 4. Factors Affecting Birth Rate, Fertility and Mortality in Bihar

Greater participation of females in economic activity also reduces the probability of greater number of children. A look at the Work Force Participation Rates (WFPR) among females in rural and urban areas of Bihar reflects that female WFPR has increased between 2004 and 2011 which is indicative of the fact that there is relatively increased participation of females in labour market which explains to an extent the decline in the birth rate both in urban as well as rural areas. The WFPR has increased in case females and the increase has been more pronounced in case of rural females which also explain the reduction in birth rate in rural Bihar as shown in Table 7.

Table 7. Work force participation rate in Bihar

Year	Rural			Urban		
	Male	Female	Person	Male	Female	Person
2004	47.7	13.8	31.6	45.2	6.5	27.2
2011	46.67	20.16	33.96	44.90	10.44	28.62

Source: National Sample Survey various rounds

The decline in birth rate over the years can also be explained by increase in the mean age of marriage as well as change in the percentage of females getting married in various age groups. As can be seen from Tables 8 and 9, on one hand the effective age of marriage has increased marginally between 2006 and 2015 both in rural areas. The mean age at effective marriage of females in the age group above 21 years has more or less remained stable around 23 while increasing marginally in 2014. On the other hand in case of urban females the age has fluctuated much.

Table 8. Mean age at effective marriage of females in Bihar between 2006 and 2015

Year	Total				Rural				Urban			
	<18	18-20	21+	All Ages	<18	18-20	21+	All Ages	<18	18-20	21+	All Ages
2006	16.0	18.9	25.8	20.0	16.0	18.9	24.0	19.2	16.1	19.0	30.1	24.6
2007	16.3	19.0	23.3	19.5	16.3	19.0	23.2	19.4	16.3	19.0	23.9	20.8
2008	16.1	19.0	23.4	19.9	16.1	19.0	23.0	19.6	16.2	19.1	25.2	22.0
2009	16.2	19.1	23.1	20.1	16.2	19.1	23.0	19.9	16.7	19.2	23.8	21.2
2010	16.4	19.2	23.5	20.6	16.4	19.2	23.4	20.5	16.2	19.3	24.0	21.9
2011	16.3	19.3	23.2	20.7	16.3	19.2	23.0	20.5	16.3	19.4	23.9	21.9
2012	16.7	19.2	23.1	20.8	16.6	19.2	23.0	20.6	17.0	19.2	23.9	22.3
2013	16.4	19.1	23.4	21.1	16.4	19.1	23.2	21.0	16.2	19.2	24.6	22.4
2014	16.8	18.8	24.9	22.1	16.8	18.8	24.9	22.0	17.0	19.0	24.9	22.9
2015	16.8	18.8	24.6	22.0	16.7	18.9	24.6	21.9	17.0	18.5	24.4	22.5

Source: Health And Family Welfare Statistics in India, Ministry of Health and Family Welfare

Although the birth rate has fallen it still remains high. This relatively high birth rate in rural Bihar can be explained by the high percentage of females who get married at an early age. There are a high percentage of rural females who get married in the age group 18-20 which although over the years has declined but the proportion still remains high.

Table 9. Percentage distribution of females in different age groups of effective marriage in Bihar between 2006 and 2015

Year	Total			Rural			Urban		
	<18	18-20	21+	<18	18-20	21+	<18	18-20	21+
2006	18.9	48.7	32.4	21.7	52.4	25.9	5.1	30.8	64.2
2007	13.5	59.4	27.1	14.2	61.7	24.1	8.2	42.7	49.2
2008	11.6	53.1	35.3	12.6	55.6	31.8	5.2	37.9	57.0
2009	9.3	52.6	38.1	9.6	54.4	36.0	7.0	39.0	54.0
2010	7.2	47.6	45.1	7.8	49.8	42.4	3.3	32.6	64.1
2011	5.8	48.1	46.1	6.2	51.2	42.5	3.5	32.1	64.4
2012	3.4	48.0	48.6	3.7	50.4	45.8	0.8	29.2	70.1
2013	3.2	41.9	54.9	3.2	43.4	53.4	2.8	29.3	68.0
2014	2.9	42.0	55.1	3.0	43.5	53.5	2.2	31.5	66.4
2015	3.6	39.0	57.4	3.6	42.2	54.2	3.7	28.4	67.9

Source: Health And Family Welfare Statistics in India, Ministry of Health and Family Welfare

A closer look at the total fertility rates of female also explains the fall in birth rate over the years. The Table 10 presents the total fertility rates in different age groups as given by National Family Health Surveys various rounds. As can be seen the overall total fertility rate (TFR) has fallen as compared between two end points of NFHS-2 and NFHS-4. Again the TFR is higher in rural areas as compared to urban which explains the relatively higher birth rate in rural area.

Fertility by background characteristic also explains that between the NFHS 3 and NFHS 4 the TFR has declined both for rural as well as urban population; however the TFR remains higher for rural Bihar. The Table 11 explains the variation in TFR which is attributed to the difference in levels of education. As the retention level in school increases the TFR in general declines. Thus, education plays an important role in keeping a check on the total fertility rate by delaying the age of marriage or promoting the scope of employability of females.

Table 10. Age specific and total fertility rates from NFHS-4, NFHS-3, and NFHS-2, by residence, Bihar

Age	NFHS-4			NFHS-3			NFHS-2		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
15-19	0.054	0.081	0.077	0.065	0.139	0.128	0.071	0.122	0.116
20-24	0.207	0.283	0.273	0.209	0.288	0.274	0.200	0.234	0.230
25-29	0.135	0.193	0.185	0.178	0.209	0.204	0.144	0.191	0.187
30-34	0.060	0.096	0.091	0.068	0.114	0.106	0.064	0.130	0.123
35-39	0.021	0.041	0.038	0.028	0.072	0.065	0.043	0.060	0.059
40-44	0.007	0.013	0.012	0.022	0.015	0.016	0.000	0.024	0.022
45-49	0.000	0.006	0.005	0.004	0.009	0.008	0.000	0.003	0.003
TFR (15-49)	2.42	3.56	3.41	2.87	4.22	4.00	2.61	3.82	3.70

Source: National Family Health Survey - 4 Report

The reduced rate of IMR can be attributed to the increase in the proportion of children receiving immunization. As can be seen from Table 12 and 13 the percentage of children receiving immunization has gone up between the third and fourth rounds of the National Family health survey (NFHS). Again the reduced rate of maternal mortality can be attributed to the marked improvement in the rate of institutional deliveries both in rural as well as urban Bihar.

Table 11. Fertility by background characteristic, Bihar, 2015-16

Background Characteristic	Total Fertility Rate NFHS-4	Total Fertility Rate NFHS-3
Residence		
Rural	2.42	4.22
Urban	3.56	2.87
Schooling		
No Schooling	4.13	4.58
<5 years complete	3.78	*
5-9 years complete	3.02	3.21
10-11 years complete	2.60	2.36 <sup>#</sup>
12 or more years complete	2.22	NA

Source: National family health survey -4 report# 10 years and above

\* Not shown; based on fewer than 125 un weighted woman-years of exposure for the total fertility rates and 25 un weighted cases for the mean number of children ever born

Table 12. Percentage of children age 12-23 months who received specific vaccines at any time before the NFHS Survey, Bihar

Period	Total immunization*		
	Rural	Urban	Total
NFHS-4	59.7	61.9	61.7
NFHS -3	31.1	45.6	32.8

Source: National family health survey various rounds

\*2 BCG, measles, and three dose each of DPT and polio vaccine (excluding polio vaccine given at birth).

Table 13. Percent distribution of live births in the five years preceding the NFHS survey in Bihar

	Percentage of births delivered in a public health facility	Percentage of births delivered in a private health facility	Percentage of births delivered in a health facility
NFHS- 4			
Urban	42.7	31.6	74.3
Rural	48.2	14.4	62.7
NFHS-3			
Urban	9.4	34.6	44
Rural	2.7	14	16.7

Source: National Family Health Survey various rounds

## 5. Conclusion and Recommendation

The status of health as reflected by the mortality rates and birth and death rate has improved over the years in Bihar. Different factors like education level, poverty ratios, public spending and other provisions of health infrastructure like immunization facility and institutional deliveries have contributed in this direction. The level of literacy affects the total fertility rate among women by increasing the effective age of marriage and hence has an impact on the overall birth rate. However the state needs to improve its health as the values of health indicators lie far away from the national average. Improved status of education, reduced poverty, better provision of health infrastructure both in rural and urban areas and improved state of public health centres can all contribute in improving the state of health in Bihar.

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