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Regional Inequality in Child Health Status in India: A Convergence Analysis

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ABSTRACT

Child malnutrition and child mortality plague an excessively large number of children in India. This prevalence of high malnourished children puts the country slightly off target to achieve the child malnutrition-related millennium development goals. From 2005-to 06, around 46 percent of the children in India are found to suffer from the problem of being underweight. Moreover; there are substantial inter-state variations in the incidence of undernourished children. In 2007, the rate of under-5 mortality in India was 72. The country's Millennium Development Goals (MDG) target for 2015 is 38. While our average annual rate of reduction in child mortality is only 2.9; it has to be 7.6 if the MDG is to be attained. Using the data generated by National Family Health Survey, Government of India, this paper attempts to examine the degree of regional inequality by considering the various measures of convergence.

We can also see that the under nutritional status and the infant mortality rate significantly converge over the period but the under-5 mortality is not.

Introduction

Child mortality and child under nutritional status are much higher in India compared to many other developing countries. Even though the prevalence of undernutrition and child mortality has shown a steady decline in recent years, there are observed to be considerable differences in the rates of decline across regions and socioeconomic groups. In many segments, child mortality and child under nutritional status remains very high. Under this scenario in this chapter, we will try to estimate the degree of regional inequality by considering the various measures of convergence.

Objectives:

The study broadly intends to explore the following research questions.

1) Does child mortality converge or diverge over time in India?
2) Does the extent of stunted and underweight of the child converge or diverge in India over time?

Methodology:

Definition of variables:

Infant Mortality Rate (IMR):

The infant mortality rate (IMR) is the probability (expressed as a rate per 1,000 live births) of a child born in a specified year dying before reaching the age of one it subject to current age-specific mortality rates. In symbol,

$$IMR = \frac{D}{B} \times 1000$$

Where D= The number of deaths of the child less than five years of age.
B = Total Number of live births.

Under 5-Mortality Rate (U5MR):

The under-five mortality rate (U5MR) is the probability (expressed as a rate per 1,000 live births) of a child born in a specified year dying before reaching the age of five it subject to current age-specific mortality rates. In symbol,

$$U5MR = \frac{D_5}{B} \times 1000$$

Where D_5= Number of deaths of a child less than five years of age.
B = Total Number of live births.

Measures of Child Nutritional Status:

The health and nutritional status of the child are usually measured in three ways:

- Through measurement of growth and body composition (anthropometrics indicator)
- Through analysis of the biochemical content of blood and urine (biochemical indicator)

- Through clinical examination of the external physical sign of nutrient deficiencies (clinical indicator)

Among the three methods of assessment, anthropometric measurement is popular and simple to measure health and nutritional status. In our study, we shall remain confined to anthropometric measures only. In the anthropometric measure, there are four components: age, weight, height, and gender. Anthropometric indices are formed by taking two or all these components together. Three indices are commonly used in assessing the nutritional status- weight for age, height for age, and weight for height. These indices are compared to a referred standard of anthropometry to assess the magnitude and distribution severity of the nutritional problem.

Weight for Age:
This measure is used to assess if a child is normal, overweight, or underweight according to their age. When a child's weights are less than expected for their age, they are called under*weight*.

Height for Age:
This measure is used to assess if a child is normal, stunted, or tall according to their age. A child who is not long or tall less than expected for their age, they are called *stunted*.
Height for age is considered a measure of past nutrition because a child is short today, and might not have had the adequate nutritional intake at some point in the past. So it is generally assumed that stunting indicates the long-term cumulative effect of inadequate nutrition and poor health status.

Weight for Height:
This measure is used to assess if a child is normal, overweight, or underweight according to their height. When a child's weights are less than expected for their height, they are called *wasted*.
Wasting is sensitive to changes in caloric intake or the effects of diseases.

Data Sources:
To examine the determinants of child mortality and the children's nutritional status in different states in India the main source of data is the three phases of the Indian National Family and Health Survey (NFHS) of the year 1992-93, 1998-99, and 2005-06. The NFHS is one of the many Demographic and Health Surveys that have been carried out in several developing countries—adopting a largely standardized questionnaire—with the primary purpose of collecting information on health, fertility, and other family issues from ever-married women of fertility age. The birth history records all births and some basic information about the child, such as sex and date of birth. NFHS data gather information on child feeding practice, and immunization status anthropometric measurement of a child under three years old. The first wave (NFHS-I) was completed between April 1992 and August 1993 on a sample of ever-married women of age between 13 and 49**.** The second wave (NFHS-II) was carried out between November 1998 and December 1999. In NFHS-3, 18 research organizations conducted interviews with more than 230,000 women aged 15-49 and men aged 15-54 throughout India. Fieldwork for NFHS-3 was conducted from December 2005 to August 2006. The largest component of the surveys is an individual questionnaire administered to each ever-married woman of fertility age in the sample. The questionnaire also includes information on health, contraception and fertility preferences, as well as a complete birth history and very detailed information on the health status of younger children. In particular, height and weight were measured for children below age four in NFHS-I, and below age 3 in NFHS-II and NFHS-III because of a lack of appropriate measuring tools, height was not measured during fieldwork in the first states covered by NFHS-I. These states, which formed the so-called Phase I of the survey, are Andhra Pradesh, West Bengal, Himachal Pradesh, Madhya Pradesh, and Tamil Nadu.

Convergence analysis for under nutritional status of the children:

- The simplest measure of convergence is σ -convergence or simply estimating the coefficient of variation.
- The absolute β- convergence implies estimating the following equation.

$$[\ln(X_{i,t}) - \ln(X_{i,t-\lambda})]/T = \alpha + \beta \ln(X_{I,t-\lambda}) + \varepsilon_{i,t}$$

Where, ln $X_{i,t}$ -ln ($X_{i,t-\lambda}$) is the state's average growth rate of the under the nutritional status of children between the period t and t-λ. T is the length of the period. If the β is significantly given a negative value then we say that there is an absolute β- convergence. This implies that the poor performing states converge with the better performing states.

σ Convergence:
The simplest measure of convergence is σ -convergence is simply estimating the coefficient of variation. In the next table, we consider the coefficient of variation of the stunted, wasted and underweight, in the three different periods – 1991-92, 1998-99, and 2005-06.

Table-8.1

Coefficient of Variation of children Under nutritional status in India

	1991-92	1998-99	2005-06
Stunted	20.17	25.35	19.59
Underweight	24.60	28.53	23.92
Wasted	38.17	39.90	30.82

Source: Data are collected from the fact sheet of the *National Family Health Survey-III*

Note: Data analysis has been done using the SPSS computer package

From this table, we see that the coefficient of variation of the children under nutritional status increases between 1992-93 to 1998-99. However, the coefficient variation of the children under nutritional status decreases in the period 1998-99 to 2005-06. This indicates that there is a trend of regional convergence in the nutritional status of children in India.

Absolute of β- Convergence

The result of absolute β- convergence stunted, underweight, and wasted is shown in the following table.

Table-8.2

The Result of Absolute β- Convergence of children under nutritional status in India

Dependent Variable	Period	Constant (t-statistic)	Coefficient On initial level (t-statistic)	R^2
Growth is stunted	1991-92 to 1998-99	0.09 (0.50)	-0.03 (-0.59)	0.02
Growth is stunted	1998-99 to 2005-06	**0.23** (3.32)	**-0.07** (-3.64)	0.47
Growth is stunted	1991-92 to 2005-06	**0.06** (1.23)	**-0.02** (-1.57)	0.14
Growth in underweight	1991-92 to 1998-99	-0.02 (-0.20)	-0.002 (-0.11)	0.006
Growth in underweight	1998-99 to 2005-06	0.19 (3.49)	-0.05 (-3.48)	0.38
Growth in underweight	1991-92 to 2005-06	0.07 (2.24)	-0.02 (-2.57)	0.26
Growth in wasted	1991-92 to 1998-99	**0.27 (3.10)**	**-0.12 (-3.55)**	0.46
Growth in wasted	1998-99 to2005-06	**0.33 (4.09)**	**-0.11 (-3.63)**	0.47
Growth in wasted	1991-92 to 2005-06	**0.18 (5.28)**	**-0.07 (-5.17)**	0.64

Source: Data are collected from the fact sheet of *National Family Health Survey-III and NSSO-Report no 505 at the state level,*

Note: Data analysis has been done using the SPSS computer package

The long-term nutritional statuses of the children measure by the stunted significantly converge in the period 1998-99 to 2005-06 but not in the period 1992-93 to 1998-99. However, stunted is convergence in the period 1992-93 to 2005-06. The rate of convergence also slowed down during the current period. In the case of the underweight, we see that in the period 1992-93 to 1998-99 that β is not statistically significant. However, in the period 1998-99 to 2005-06 convergence coefficient is found to be is significant. If we consider the overall years of the period of 1992-93 to 2005-06, we see that there is a trend of convergence in the extent of underweight. The underweight significantly converges. The rate of convergence of the underweight also slowed down in the current period. Interestingly the rate of convergence of wasted is found to be the same between the period 1992-93 to 1998-99 and 1998-99 to 2005-06. The details result For stunted is shown in the appendix table 13A, 14A, and 15A. For wasted the detailed result is shown in the appendix table-16A, 17a, 18A. The detailed result for underweight is shown in Tables 19A, 20A, and 21A.

Convergence analysis for the child mortality in India:

σ Convergence:

The estimation of the coefficient variation of infant mortality is shown in the following table.

Table-8.3

Coefficient of Variation of IMR

Year	Coefficient of variation
1981	23.39
1991	34.89
2001	32.08
2008	33.71

source: Data are collected from the fact sheet of *National Family Health Survey-III and NSSO-Report no 505 at the state level,*
Note: Data analysis has been done using the SPSS computer package

From the above table, we see that the coefficient of variation of IMR increases during the period 1981 to 1991. In 2008 the coefficient of variation is higher than in 1981. So the inequality in infant mortality increases during the period 1981 to 2008.

Table -8.4

Coefficient of Variation of under-5 mortality rate

Year	1992-93	1998-99	2005-06
Coefficient of variation	31.73	36.47	36.43

Source: Data are collected from the fact sheet of *National Family Health Survey-III and NSSO Report no 505 at the state level,*
Note: Data analysis has been done using the SPSS computer package

The coefficient of variation increases during the period 1992-93 to 2005-06 and slightly increases during the period 1998-99 to2005-06.

The absolute β convergence:

The result of absolute β- convergence of Infant mortality rate, Under-5 mortality rate is shown in the following table.

Table-8.5

Absolute β- convergence of the Infant Mortality Rate

Dependent Variable	Period	Constant (t-statistic)	Coefficient On initial level (t-statistic)	R^2
Growth in infant mortality rate	1981-91	0.19 (2.26)	-0.03 (-2.22)	0.28
Growth in infant mortality rate	1991-2001	0.21 (4.00)	-0.03 (-3.98)	0.55
Growth in infant mortality rate	2001-2008	0.23 (2.41)	-0.03 (-2.39)	0.30
Growth in infant mortality rate	1981-2008	0.14 (6.62)	-0.02 (-6.52)	0.77

Source: Data are collected from the fact sheet of *National Family Health Survey-III and NSSO-Report no 505 at the state level,*
Note: Data analysis has been done using the SPSS computer package

From the above table, we see that infant mortality has converged significantly in all the periods. If we consider the overall period (1992-93 to 2005-06) then we see that the IMR has converged significantly across the states of India. This result implies that the states, which have a high rate of child mortality, reduce child mortality at a faster rate than the states, with a low rate of IMR. It can be importantly noted that the rate of convergence has been slowed down during the current period. The detailed result of the IMR is shown in the appendix tables 22A, 23A,24a, and 25A.

The result of absolute β- convergence of the Under-5 mortality rate is shown in the following table.

Table-8.6

Absolute β- convergence of the under-5 Mortality Rate

Dependent Variable	Period	Constant (t-statistic)	Coefficient On initial level (t-statistic)	R^2
Growth In Under-5 Mortality Rate	1991-92 to 1998-99	-0.1 (-0.75)	0.01 **(0.46)**	0.01
Growth In Under-5 Mortality Rate	1998-99 to 2005-06	-0.22 (-3.59)	0.03 (2.38)	0.26
Growth In Under-5 Mortality Rate	1991-92 to 2005-06	-0.07 (1.46)	0.01 (0.62)	0.02

source: Data are collected from the fact sheet of *National Family Health Survey-III and NSSO-Report no 505 at the state level,*
Note: Data analysis has been done using the SPSS computer package

From the analysis of the absolute β convergence of the under-5 mortality rate, we see that in the period 1998-99 β is significant but takes a positive sign, which implies that in the states, which have the higher under-5 mortality, the rate of reduction, of these states are found to be lower than the states, which have the lower under-5 mortality rate. For detailed results please refer to appendix table -26A, 27Aand 28A

Conditional β convergence of the Infant mortality rate:

- The conditional β- convergence implies the estimate of the following equation.

$$[\ln(X_{i,t}) - \ln(X_{i,t-\lambda})]/T = \alpha + \beta \ln(X_{I,t-\lambda}) + \delta \ln PC + \phi D_{i,t} + \varepsilon_{i,t}$$

The entire data are data collected from the three phases of NFHS except for the recent data on the under-5 mortality, which is collected from the sample registration system. In this equation, we use the per capita health expenditure of the state government as a conditional variable, and a dummy variable ($D_{i,t}$) for 1991 to see if there has been any structural shift in the relationship in that year.

Table -8.7

The result of the conditional β convergence of infant mortality.

Independent variables	Beta (t-statistic)
Constant	0.15 (5.28)
$\ln(X_{i,t-\lambda})$	-0.02 (-5.23)
Ln percentage of health expenditure in total expenditure of the state government	0.0005 (1.01)
$D_{i,t}$	-0.0008 (-2.45)
R^2	0.41
F- statistic	13.17

Source: Data are collected from the fact sheet of *National Family Health Survey-III and NSSO-Report no 505 at the state level,*

Note: Data analysis has been done using the SPSS computer package

The result of the conditional β convergence reveals that the percentage of health expenditure on total expenditure has no significant effect on the annual average growth rates of the infant mortality rate. The initial level of variables is negatively significant. This result implies that there is a strong tendency for convergence. The structure of the equation of the variables has been changed during the period 1991, as the coefficient of the dummy variable is statistically significant. For a detailed analysis see the table -29A

Conclusions

We have estimated the relative performance of 15 major Indian states on child health and mortality. We have concentrated on the measure of convergence and examined the regional inequality in the prevalence of child mortality and child undernutrition in different states in India. First, we consider the coefficient of variation to measure the regional inequality in India. From this table, we see that the coefficient of variation of the children under nutritional status increases between 1992-93 to 1998-99. However, the coefficient variation of the children under nutritional status decreases in the period 1998-99 to 2005-06. However, the value of the coefficient of variation in 2005-06 is lower than the value of 1991-92 for all the three measures of under nutritional status of the children. So, the regional disparity between the states in terms of a child under nutritional status has declined.

The coefficient of variation of infant mortality was observed to be lower in 1981 compared to 1991, 2001, and 2008. The rate was increased in the period 1991 but now it is declining. The Coefficient of variation for the under-5 mortality increased during the period 1992-93 to 1998-99 but slightly slowed down during 1998-99 to 2005-06.

Secondly, we considered the absolute β convergence of the -child health-related outcomes infant mortality rate, Under-5 mortality rate, stunted, and underweight and wasted. The long-term nutritional statuses of the children measure by the stunted significantly converge in the period 1998-99 to 2005-06 but not in the period 1992-93 to 1998-99. However, over 1992-93 to 2005-06, the trend of convergence is established. In the case of the underweight, we see that in the period 1992-93 to 1998-99, β is not statistically significant. However, in the period 1998-99 to 2005-06, the convergence coefficient is found to be significant. If we consider the overall years of the period of 1992-93 to 2005-06, we see that the underweight are showing significantly convergence. The rate of convergence of the underweight also slowed down in the current period. The rate of convergence of wasted also shows the same trend.

Infant mortality has converged significantly in all the periods. From the analysis of the absolute β convergence of the under-5 mortality rate, we see that in the period 1998-99 β is significant but takes a positive sign.

From the above analysis, we see that there is a convergence in the infant mortality, stunted and underweight, and wasted but not in the under-5 mortality. However, we can see that the rate of convergence slowed down in recent years. The situation of reperformed

states are found to get worse than the better-performed states. This is causing concern for child wellbeing from a human development perspective.

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Appendix:

TABLE-13(A)

ABSOLUTE β CONVERGENCE OF STUNTED (1991-92 to 1998-99)

	Coefficients	*Standard Error*	*t Stat*	*P-value*
Intercept	0.09	0.18	0.50	0.63
Ln stunted(1991-92)	-0.03	0.05	-0.54	0.59

ANOVA

	df	*SS*	*MS*	*F*
Regression	1.00	0.00	0.00	0.30
Residual	15.00	0.03	0.00	
Total	16.00	0.03		

Regression Statistics	
Multiple R	0.14
R Square	0.02
Adjusted R Square	-0.05
Standard Error	0.04
Observations	17.00

TABLE-14(A)

ABSOLUTE β CONVERGENCE OF STUNTED (1998-99 to 2005-06)

	Coefficients	*Standard Error*	*t Stat*	*P-value*
Intercept	0.23	0.07	3.32	0.00
Ln stunted(1998-99)	-0.07	0.02	-3.64	0.00

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1.00	0.01	0.01	13.23	0.00
Residual	15.00	0.01	0.00		
Total	16.00	0.01			

Regression Statistics	
Multiple R	0.68
R Square	0.47
Adjusted R Square	0.43
Standard Error	0.02
Observations	17.00

TABLE-15(A)
ABSOLUTE β CONVERGENCE OF STUNTED (1991-92 to 2005-06)

	Coefficients	*Standard Error*	*t Stat*	*P-value*
Intercept	0.06	0.05	1.23	0.24
Ln stunted(1991-92)	-0.02	0.01	-1.57	0.14

ANOVA					
	df	*SS*	*MS*	*F*	*Significance F*
Regression	1.00	0.00	0.00	2.46	0.14
Residual	15.00	0.00	0.00		
Total	16.00	0.00			

Regression Statistics	
Multiple R	0.38
R Square	0.14
Adjusted R Square	0.08
Standard Error	0.01
Observations	17.00

TABLE-16(A)
ABSOLUTE β CONVERGENCE OF UNDERWEIGHT (1991-92 to 1998-99)

	Coefficients	*Standard Error*	*t Stat*	*P-value*
Intercept	-0.02	0.08	-0.20	0.84
Ln underweight(19921-92)	0.002	0.02	-0.11	0.92

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1.00	0.00	0.00	0.01	0.92
Residual	19.00	0.02	0.00		
Total	20.00	0.02			

Regression Statistics	
Multiple R	0.02
R Square	0.006
Adjusted R Square	-0.05
Standard Error	0.03
Observations	21.00

TABLE-17(A)
ABSOLUTE β CONVERGENCE OF UNDERWEIGHT (1998-99 to 2005-06)

	Coefficients	*Standard Error*	*t Stat*	*P-value*
Intercept	0.19	0.05	3.49	0.00
Ln underweight (1998-99)	**-0.05**	0.02	-3.48	0.00

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1.00	0.01	0.01	12.14	0.00
Residual	19.00	0.01	0.00		
Total	20.00	0.02			

Regression Statistics	
Multiple R	0.62
R Square	0.39
Adjusted R Square	0.36
Standard Error	0.02
Observations	21.00

TABLE-18(A)
ABSOLUTE β CONVERGENCE OF UNDERWEIGHT (1991-92 to 2005-06)

	Coefficients	*Standard Error*	*t Stat*	*P-value*
Intercept	0.07	0.03	2.24	0.04
Ln underweight(1991-92)	-0.02	0.01	-2.57	0.02

ANOVA					
	df	*SS*	*MS*	*F*	*Significance F*
Regression	1.00	0.00	0.00	6.60	0.02
Residual	19.00	0.00	0.00		
Total	20.00	0.00			

Regression Statistics	
Multiple R	0.51
R Square	0.26
Adjusted R Square	0.22
Standard Error	0.01
Observations	21.00

TABLE-19(A)
ABSOLUTE β CONVERGENCE OF WASTED (1991-92 to 1998-99)

	Coefficients	*Standard Error*	*t Stat*	*P-value*
Intercept	0.27	0.09	3.10	0.01
Ln wasted(1991-92)	-0.12	0.03	-3.55	0.00

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1.00	0.06	0.06	12.62	0.00
Residual	15.00	0.07	0.00		
Total	16.00	0.13			

Regression Statistics	
Multiple R	0.68
R Square	0.46
Adjusted R Square	0.42
Standard Error	0.07
Observations	17.00

TABLE-20(A)

ABSOLUTE β CONVERGENCE OF WASTED (1998-99 to 2005-06)

	Coefficients	*Standard Error*	*t Stat*	*P-value*
Intercept	0.33	0.08	4.09	0.00
Ln wasted(1998-99)	-0.12	0.03	-3.63	0.00

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1.00	0.04	0.04	13.20	0.00
Residual	15.00	0.04	0.00		
Total	16.00	0.08			

Regression Statistics	
Multiple R	0.68
R Square	0.47
Adjusted R Square	0.43
Standard Error	0.05
Observations	17.00

TABLE-21(A)

ABSOLUTE β CONVERGENCE OF WASTED (1991-92 to 2005-06)

	Coefficients	*Standard Error*	*t Stat*	*P-value*
Intercept	0.18	0.03	5.28	0.00
Ln wasted 1991-92	-0.07	0.01	-5.17	0.00

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	$1.00	$0.02	$0.02	26.78	0.00
Residual	$15.00	$0.01	$0.00		
Total	$16.00	$0.03			

Regression Statistics	
Multiple R	0.80
R Square	0.64
Adjusted R Square	0.62
Standard Error	0.03
Observations	17.00

TABLE -22(A)
ABSOLUTE β CONVERGENCE OF OR (1981 to1991)

	Coefficients	*Standard Error*	*t Stat*	*P-value*
Intercept	0.19	0.09	2.26	0.04
Ln IMR 1981	**-0.03**	0.01	-2.22	0.04

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1.00	0.00	0.00	4.95	0.04
Residual	13.00	0.00	0.00		
Total	14.00	0.00			

Regression Statistics	
Multiple R	0.52
R Square	0.28
Adjusted R Square	0.22
Standard Error	0.00
Observations	15.00

TABLE-23(A)
ABSOLUTE β CONVERGENCE OF IMR (1991 to 2001)

	Coefficients	*Standard Error*	*t Stat*	*P-value*
24(a)Intercept	0.21	0.05	4.00	0.00
Ln IMR (1991)	**-0.03**	0.01	-3.98	0.00

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1.00	0.00	0.00	15.80	0.00
Residual	13.00	0.00	0.00		
Total	14.00	0.00			

Regression Statistics	
Multiple R	0.74
R Square	0.55
Adjusted R Square	0.51
Standard Error	0.00
Observations	15.00

TABLE-24(A)
ABSOLUTE β CONVERGENCE OF IMR (2001 to 2008)

	Coefficients	*Standard Error*	*t Stat*	*P-value*
Intercept	0.23	0.09	2.41	0.03
Ln IMR 2001	-0.03	0.01	-2.39	0.03

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1.00	0.00	0.00	5.70	0.03
Residual	13.00	0.00	0.00		
Total	14.00	0.00			

Regression Statistics	
Multiple R	0.55
R Square	0.30
Adjusted R Square	0.25
Standard Error	0.00
Observations	15.00

TABLE-25(A)
ABSOLUTE β CONVERGENCE OF IMR (1981 to 2008)

	Coefficients	*Standard Error*	*t Stat*	*P-value*
Intercept	0.14	0.02	6.62	0.00
Ln IMR 1981	-0.02	0.00	-6.52	0.00

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1.00	0.00	0.00	42.49	0.00
Residual	13.00	0.00	0.00		
Total	14.00	0.00			

Regression Statistics	
Multiple R	0.88
R Square	0.77
Adjusted R Square	0.75
Standard Error	0.00
Observations	15.00

TABLE-26(A)
ABSOLUTE β CONVERGENCE OF U5MR (1991-92 to 1998-99)

	Coefficients	*Standard Error*	*t Stat*	*P-value*
Intercept	-0.10	0.14	-0.75	0.47
Ln U5MR(1991-92)	0.01	0.03	0.46	0.65

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1.00	0.00	0.00	0.21	0.65
Residual	16.00	0.03	0.00		
Total	17.00	0.03			

Regression Statistics	
Multiple R	0.11
R Square	0.01
Adjusted R Square	-0.05
Standard Error	0.05
Observations	18.00

TABLE-27(A)
ABSOLUTE β CONVERGENCE OF U5MR (1998-99 to 2005-06)

	Coefficients	*Standard Error*	*t Stat*	*P-value*
Intercept	-0.22	0.06	-3.60	0.00
Ln U5MR(1998-99)	0.03	0.01	2.38	0.03

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1.00	0.00	0.00	5.67	0.03
Residual	16.00	0.01	0.00		
Total	17.00	0.02			

Regression Statistics	
Multiple R	0.51
R Square	0.26
Adjusted R Square	0.22
Standard Error	0.03
Observations	18.00

TABLE-28(A)
ABSOLUTE β CONVERGENCE OF U5MR (1998-99 to 2005-06)

	Coefficients	*Standard Error*	*t Stat*	*P-value*
Intercept	-0.07	0.05	-1.46	0.16
Ln U5MR	0.01	0.01	0.62	0.54

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1.00	0.00	0.00	0.39	0.54
Residual	16.00	0.00	0.00		
Total	17.00	0.00			

Regression Statistics	
Multiple R	0.15
R Square	0.02
Adjusted R Square	-0.04
Standard Error	0.02
Observations	18.00

TABLE-29
CONDITIONAL β CONVERGENCE OF IMR

	Coefficients	*Standard Error*	*t Stat*	*P-value*
Intercept	0.15	0.03	5.28	0.00
Ln IMR of previous year	**-0.02**	0.00	-5.23	0.00
LN(percentage of health expenditure on total expenditure of the state government)	**0.00**	0.00	1.01	0.32
Dummy (1991)	**0.00**	0.00	-2.45	0.02

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	3.00000	0.00005	0.00002	13.17079	0.00000
Residual	56.00000	0.00007	0.00000		
Total	59.00000	0.00011			

Regression Statistics	
Multiple R	0.64
R Square	0.41
Adjusted R Square	0.38
Standard Error	0.00
Observations	60.00