

Appraisal of Progress and Prospects of Millennium Development Goals indicator Under-Five Mortality Rate in India: A study of Pre and Post Strategy Intervention Period

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Abstract: Since the launch of the Millennium Development Goals at the Millennium Summit in New York September 2000, the MDGs have become the most widely accepted yardstick of development efforts by government. The main objective of present study is appraising the Millennium Developmental Goal 4, indicator 13 i.e. to reduce Under-Five Mortality Rate by two-thirds between 1990 and 2015. The study is divided into two periods. First period dates back from 1990-2001. The second period covers decade of 2003-2015. During the first period, there was no strategy in place to achieve these goals. But in the second period, state put the designed strategy in place to attain these goals in the time bound framework. The study find out that the Historic Rate Change of reduction of Under-Five Mortality Rate for India in the period 1990-2001 was 3.4 per cent and accelerating with HRC 5.3 per cent for the period 2003–2015. The significant improvement in the second period (2003-15) in child health services in India as follow the MDG initiative and it had a substantial impact on reducing child mortality over the past decades. The Actual Annuls Rate of Progress of India made in reduction of U5MR 2.62 percent and manages the U5MR at 43 in 2015, while India is required to decline U5MR 2.67 per cent annually between 1990 to 2015 to achieve the target

Key Words: Millennium Developmental Goal, Under-Five Mortality Rate.

1. INTRODUCTION:

Millennium Developmental Goals (MDGs) focus on the reduction in infant and child mortality. It is likely one of important goal of millennium declaration because children are the most important assets of a country. Millennium Developmental Goals target to reduce Child Mortality by two-thirds, between 1990 and 2015(1). India is home to the largest child population in the world, significantly larger than the number in China (2). The country has 20 per cent of the 0-4 years' child population of the world. The number of live births in the country is estimated to be 27 million, which again constitutes 20 per cent of the total number of live births in the world (3). India is among the countries where child mortality rate is alarmingly high and it is one of the important indicators of a country's general medical and public health conditions, and consequently, the country's level of socio-economic development. Its decline is therefore not only desirable but also indicative of an improvement in general living standards (4). In the year 2000, the United Nations adopted eight Millennium Development Goals. These Millennium Development Goals were based on the assumption that "progress that World has made over the past 30 years shows that these goals are attainable". Most of the countries in the World, including India, have committed themselves to attain the target embodied in the Millennium Declaration by 2015. The fourth goal MDGs target on reduce Child Mortality by two-thirds between 1990 and 2015 (5).

2. UNDER FIVE MORTALITY RATE:

The Under-Five Mortality Rate (U5MR) measure the probability of a child born in a specified year dying before reaching the age of five(6). The U5MR is an appropriate indicator of the cumulative exposure to the risk of death during the first five years of life and an accepted global indicator of the health and socioeconomic status of given population(7). Child Mortality of a nation describes the condition of health facilities and well being of the children of that Nation. Children are important assets of a nation, therefore reduction in infant and child mortality is likely the most important objective of the Millennium Development Goals -4(8). The MDGs 4 is to keep more children alive. For India reduction of child mortality two-thirds, between 1990 and 2015, this would imply a reduction of the U5MR to 42 by 2015.

3. SOURCE OF DATA: The main sources of data are: The National Family Health Survey & Sample Registration System (SRS).

4. RESEARCH METHODOLOGY:

The methodology for tracking the MDGs in this work is the one prescribed by the UNSD for developing countries. This methodology is characterized by the simplicity of its formulation and ease of interpretation.

Estimate Historical Rate of Change (9)

$$r = \exp[(\ln X_t - \ln X_0)/t - 1]$$

Where X_t is indicator value for year t , which gives for $t=0$, r is historical rate of change

Calculate required rate of change (10):

The Actual Annual Rate of Progress (AARP)

The methodology to be used for computing the AARP for those variables where the desirable value is 0 is:

$$\frac{(X_{t_1} - X_{t_0} / X_{t_0})}{t_1 - t_0}$$

Where,

t_0 is the year 1990

t_1 is the most recent year for which data are available, and

X_{t_0} and X_{t_1} are the values of the indicator for base year and end year respectively.

Required Annual Rate of Progress (RARP)

The required annual rate of progress is the rate which is necessary to reach the MDG. It is calculated as:

$$\frac{\alpha}{t_{mdg} - t_0}$$

t_{mdg} is the year by which the target is to be met, and t_0 is the year closest to 1990 for which the target is to be met.

5. RESULTS AND DISCUSSION:

Millennium Developmental Goals-4, indicator 13 to reduce by two-thirds, between 1990 and 2015, Under Five mortality rate. The study is divided into two periods. First period dates back from 1990-2001. The second period covers decade of 2003- 2015. During the first period, there was no strategy in place to achieve these goals. But in the second period, state put the designed strategy in place to attain these goals in the time bound manner. As reference to Sample Registration System in 1990 the U5MR of India was estimated 125 and target is to bring down Under Five Mortality Rate (U5MR) to 43 per 1,000 live births. The Table no 1.shows the trends of Under Five Mortality Rate from 1990 to 2001

Table: 4.1.The status and tends of progress of under -5 mortality rate 1990 to 2001

S. No.	State	1990	2001	HRC ¹
1	Andhra Pradesh	100	72.6	3.0
2	Arunachal Pradesh	76	62.9	1.7
3	Assam	142	104.1	2.9
4	Bihar	138	101.1	3.2
5	Delhi	86	58.9	3.9
6	Goa	51	35.7	3.7
7	Gujarat	115	82.1	3.4
8	Haryana	111	77.8	3.6
9	Himachal Pradesh	68	53.9	2.3
10	Jammu & Kashmir	134	72.8	6.1
11	Karnataka	94	68.3	3.3
12	Kerala	33	22.2	4.1
13	Madhya Pradesh	148	113.7	2.7
14	Maharashtra	75	53.9	3.4
15	Manipur	68	52.9	2.6
16	Meghalaya	105	85.3	2.2

17	Orissa	136	105	2.6
18	Punjab	76	59.4	2.6
19	Rajasthan	113	93.4	2.0
20	Sikkam	136	77.8	5.7
21	Tamil Nadu	103	62.1	5.2
22	Tripura	97	65.9	4.1
23	Uttar Pradesh	152	114.3	2.9
24	West Bengal	102	71.2	3.7
	India	125	89.6	3.4

Source: National Family Health Surveys & Office of Registrar General of India

The table 1 reveals that overall U5MR for India was about 125 in 1990, which has gone down to 86.5 in 2001, registering a decline of 3.4 per cent of Historic Rate of Change (HRC) during this period. However, there was found to be a large difference in the level of U5MR the states. The states, which seem to have done considerably well in reducing U5MR were Jammu Kashmir with Historic Rate of Change of 6.1 per cent followed by Sikkim(5.7 %), Tamil Nadu(5.2%), Kerala & Tripura (4.1 %) and other better performing states are Delhi(3.9%), West Bengal(3.7%), Goa (3.7%), Haryana(3.6%), Gujarat(3.4%) and Maharashtra(3.4%) equal or more than average HRC of decline of India 3.4 per cent in the period 1990 to 2001. The status and trends of progress of under -5 mortality rate 2003 to 2015 in India and state are shown in table 2:-

Table 2 . The status and trends of progress of under -5 mortality rate 2003 to 2015

S.No	State	2003	2009	2015	HRC
1	Andhra Pradesh	67.7	52	39	4.7
2	Arunachal Pradesh	57.6	41.6	62	-0.6
3	Assam	98.2	87	63.2	3.7
4	Bihar	91.0	70	48	5.5
5	Chhattisgarh	98.1	67	48	6.1
6	Delhi	51.2	37	20	8.2
7	Goa	31.6	23.3	13	7.7
8	Gujarat	73.5	61	39	5.4
9	Haryana	70.0	60	43	4.1
10	Himachal Pradesh	50.8	51	33	3.7
11	Jammu&Kashmir	64.5	50	28	7.2
12	Jharkhand	101.9	62	39	8.3
13	Karnataka	61.2	50	31	5.8
14	Kerala	19.4	14	13	3.4
15	Madhya Pradesh	103.2	89	62	4.3
16	Maharashtra	47.4	36	24	5.8
17	Manipur	48.8	40.7	32.5	3.4
18	Meghalaya	78.0	63.3	40	5.7
19	Orissa	96.2	84	56	4.6
20	Punjab	54.0	46	27	5.9
21	Rajasthan	86.4	74	50	4.7
22	Sikkim	65.6	N.A	32	6.2
23	Tamil Nadu	52.7	33	20	8.4
24	Tripura	56.2	36.8	17.4	10.3
25	Uttar Pradesh	103.3	85	51	6.1
26	Uttarakhand	N.A	52.9	38	3.6
27	West Bengal	62.5	40	30	6.3
	India	80.4	64	43	5.3

Source: Office of Registrar General of India

The table 2 show that at the end of MDG stipulated period, the status of all India level is at 43 in 2015 with Historic Rate of change of 5.3 per cent between the periods of 2003 to 2015. That means despite the impressive pace of decrease U5MR India marginally miss the MDGs target. The table.2 also pointed out that the present status of along with the extent of progress achieved in the last one decade; give a better picture of the performance of the States in reducing Under Five Mortality Rate. The States which showed highest points of decline during 2003-2015 are Tripura

declined with highest Historic Rate of Change (HRC) of 10.3 per cent followed by Tamil Nadu (8.4 %), Jharkhand (8.3%), Delhi (8.2 %) ,Goa (7.7 %) , Jammu & Kashmir (7.2 %), Sikkim (6.2 %) , Utter Pradesh & Chhattisgarh(6.1 %), other better performing states are Punjab(5.9%), Maharashtra(5.8%),Karnataka(5.8%), Meghalaya(5.7%), Bihar(5.5%), Gujarat(5.4%) more than average HRC of decline of India 5.3 per cent. On the other side, Arunachal Pradesh had record negative HRC of 0.6 per cent in same period.

Table 3-Appraisal of Progress in Pre and Post Strategy Intervention Periods and State performance reducing Under-Five Mortality Rate

S. No.	State	HRC ¹	HRC ²	AARP	Progress Remarks(RARP-2.67)
1	Andhra Pradesh	3.0	4.7	2.44	Insufficient
2	Arunachal Pradesh	1.7	-0.6	0.74	Very Poor
3	Assam	2.9	3.7	2.22	Insufficient
4	Bihar	3.2	5.5	2.61	On Track
5	Delhi	3.9	8.2	3.07	Achieved
6	Goa	3.7	7.7	2.98	Achieved
7	Gujarat	3.4	5.4	2.64	On Track
8	Haryana	3.6	4.1	2.45	Insufficient
9	Himachal Pradesh	2.3	3.7	2.06	Insufficient
10	Jammu & Kashmir	6.1	7.2	3.16	Achieved
11	Karnataka	3.3	5.8	2.68	Achieved
12	Kerala	4.1	3.4	2.42	Insufficient
13	Madhya Pradesh	2.7	4.3	2.32	Insufficient
14	Maharashtra	3.4	5.8	2.72	Achieved
15	Manipur	2.6	3.4	2.09	Insufficient
16	Meghalaya	2.2	5.7	2.48	Insufficient
17	Orissa	2.6	4.6	2.35	Insufficient
18	Punjab	2.6	5.9	2.58	On Track
19	Rajasthan	2.0	4.7	2.23	Insufficient
20	Sikkim*	5.7	6.2	3.06	Achieved
21	Tamil Nadu	5.2	8.4	3.22	Achieved
22	Tripura	4.1	10.3	3.28	Achieved
23	Uttar Pradesh	2.9	6.1	2.67	Achieved
24	West Bengal	3.7	6.3	2.82	Achieved
	India	3.4	5.3	2.62	On Track

ARP-Actual Rate of Annual Progress, RRP-Required Rate of Annual Progress,
 TV - Targeted Value

The table 3 indicates that the Historic Rate Change of reduction of Under- five Mortality Rate for the period 1990 to 2001 was 3.4 per cent and accelerating with better HRC 5.3 per cent for the period 2003 to 2015. The significant improvement in the second period (2003-15) in health services in India as follow the MDG initiative and it had a substantial impact on reducing U5MR over the past decades. The rate of decline in U5MR in the two periods differs widely across the states. After the UN declaration India and most of the all nation of the world were committed toward human development. The table 3 reveals that majority of the states performed much better after UN declaration 2000 where the states are more focus to achieve these goals , only two states Kerala and Arunachal Pradesh performance slight better in the period 1990 to 2001 as compare to second Period. The state like, Goa, Tripura, Meghalaya, Utter Pradesh, Rajasthan, Punjab and NCR Delhi reduce U5MR with the double or near about double rate of change in after UN declaration as compare the period 1990-2001. In MDGs period, India put designed strategy in place to attain these goals and launched programme like National Rural Health Mission. The NRHM introduced in 2005 had been the major policy initiative in the health sector that has exclusively focused on accelerating the achievements of health-related MDGs in the country. Therefore, the rate of achievement with respect to the MDG health indicators would surely be expected to be higher during the NHM phase, which is from 2005 to present, compared with the pre-NHM phase (11).

To achieve the GOAL 4, indicator 13 targets on reduce by two-thirds, between 1990 and 2015, the Under Five Mortality Rate, India is Required Annual Rate of Progress (RARP) of 2.67 which is necessary to reach the target. However Actual Annual Rate of Progress (AARP) was estimated between the periods of 1990 to 2015 to be 2.62. In other words, at this rate of decline India is able to reduce 125 to 43 deaths per 1,000 live births by the end of 2015.

Though India accounts for the highest burden of Under-5 deaths in the world, there has been a faster decline in its reduction as compared to the global fall (12). The rate of decline Under Five Mortality Rate between the 1990 to 2015 differ widely across the states, as above table shown the 8 states able to reduce by two-thirds with more than 2.67 RARP of the Under Five Mortality Rate between 1990 and 2015, and achieve their respective target value. However state like Kerala(13) Punjab(27), Maharashtra(24),Karnataka(31),Sikkim(32), Manipur (32.5), Himachal Pradesh(33), Andhra Pradesh (39) Meghalaya (40) and Haryana(41) have less U5MR than the National level target. But these states remain lagging behind to achieving their respective U5MR targets. However, Utter Pradesh, which is the biggest state of India and also the part of BIMARU state approximately achieve the target and reduce the Under Five Mortality Rate to 51 as compare to the target value 50.7 with AARP 2.67 per cent as compare to RARP 2.67 in the period between 1990 and 2015. The Arunachal Pradesh is the worst performer in term of AARP as 0.74 per cent as compare to RARP 2.67 per cent.

6. CONCLUSION:

The analysis outline that the Historic Rate Change of reduction of U5MR for India in the period 1990–2001 was 3.4 per cent and accelerating with HRC 5.3 per cent for the period 2003–2015. The significant improvement in the second period (2003–15) in Child health services in India as follow the MDG initiative and it had a substantial impact on reducing child deaths over the past decades. Although the first and second period focused substantially on reducing U5MR, in MDG period, India put designed strategy to attain these goals and launched programme like National Rural Health Mission. The NRHM introduced in 2005 had been the major policy initiative in the health sector that has exclusively focused on accelerating the achievements of health-related MDGs in the country. The NRHM invested significantly more resources and effort into strengthening the health system than the earlier vertical programmes. Therefore, the U5MR was expected to reduce faster in MDGs period. The MDG -4, indicator 13 India requires to reduce under five mortality rate by two-thirds 125 to 42 during 1990 and 2015. The Actual Annuls Rate of Progress of India made in reduction of U5MR 2.62 per cent and manages the U5MR at 43 in 2015, while India is required to decline IMR 2.67 per cent annually between 1990 to 2015 to achieve the target. That means India follows the guidelines of United Nations and put proper strategy and planning. It shows a remarkable progress in reducing U5MR and almost achieved the respective target at the end of MDGs period. In India U5MR varies considerably from state to state. The state Jammu & Kashmir, Sikkim, Tripura, Karnataka, Tamil Nadu, West Bengal, Goa, NCR Delhi and even Utter Pradesh achieved and Gujarat, Punjab and Bihar almost touch their respective targets of Under Five Mortality Rate at the end of MDGs period.

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