Infant and Child Mortality in India: Levels, Trends and Determinants
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ABSTRACT

Infant and child mortality is one of the sensitive indicators of a country's socio-economic development. Millennium Development Goals (MDG) includes eight international development goals and to reduce child mortality is one of the goals. India being the signatory to the Millennium Summit Declaration (2000) aims at reducing child mortality by the year 2015. In National Population Policy 2000, National health Policy 2002 and National Rural Health Mission2005-2015, high priority has been given to reduce infant mortality rate. Though the infant and child mortality rate in India has been declining over last few several decades but there is a growing concern that the rate of decline is not fast enough to achieve Millennium Development Goal-4 by 2015, that of reducing under-five mortality rate by 2/3rd from the baseline levels of 1990. In the last decade, significant investments have been made to improve healthcare that are likely to have an additional impact on the rate of decline. As per latest data released by British Journal "The Lancet", 20% of world's under-5 deaths occur in India. India's under-five mortality rate (U5MR) for 2015 is about seven times higher than in some high-income countries, where 1 in 147 children died before their fifth birthday. The main killers of Indian children aged below five years are infectious diseases such as pneumonia and diarrhea. The present paper attempts to study the levels, trend and determinants of infant and child mortality in India.

Keywords: *Infant Mortality Rate (IMR), Under-Five Mortality Rate (U5MR), Millennium Development Goals (MDG).*

OBJECTIVE

The objective of the paper is to analyze the levels, trends and determinants of infant and child mortality in India.

RESEARCH METHODOLOGY

The paper is descriptive in nature and it is based upon secondary source of data i.e. Unicef, National Institute of Medical Sciences (NIMS)and Indian Council of Medical Research (ICMR). SPSS tool has been used to study the association between GDP and IMR.

INTRODUCTION

IMR and U5MR which indicate the probability of dying before the age of one and before the age of five (per 1000 live births) of a country are widely accepted and long standing indicators of well being of her children. High IMR shows the unmet health needs and unfavorable environmental factors. The U5MR shows the cumulative exposure to the risk of death during first five years. As per latest data, 20% of world under- five deaths occur in India. India's U5MR for 2015 is about seven times higher than in some high-income countries, where 1 in 147 children died before their fifth birthday. One in every 21 children born in India is dying before the age of five, and one in every five under-five deaths in the world is an Indian's, but the brighter part is that India's U5MR has dropped 62% since 1990- from 126 deaths per 1000 live births to 48. This is higher than the average global reduction of 53%. The main killers of Indian children aged below five years are infectious diseases such as pneumonia and diarrhea. In 2015, pneumonia accounted for an estimated 15% of the 12 lakhs under-five deaths in India and whereas diarrhea accounted for about 9%.

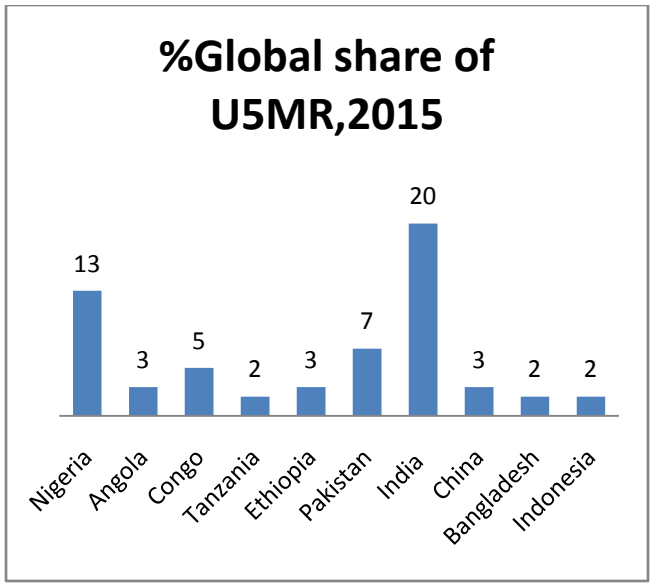
U5MR: WORLD SCENARIO

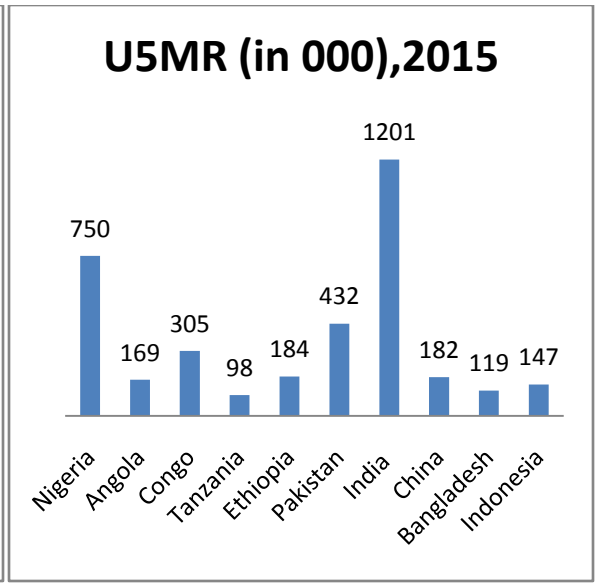
As per latest data released by British Journal "The Lancet", 20% of world's under- five deaths occur in India. India's under-five mortality rate (U5MR) for 2015 is about seven times higher than in some high-income countries, where 1 in 147 children died before their fifth birthday.

Table 1: Top Ten Countries with Highest Number of U5MR in 2015

Country	Global share %	U5MR (in 000)
Nigeria	13	750
Angola	03	169
Congo	05	305
Tanzania	02	98
Ethiopia	03	184
Pakistan	07	432
India	**20**	**1201**
China	03	182
Bangladesh	02	119
Indonesia	02	147

Source: Unicef Inter-agency Group for Child Mortality Estimation (UNIGME)





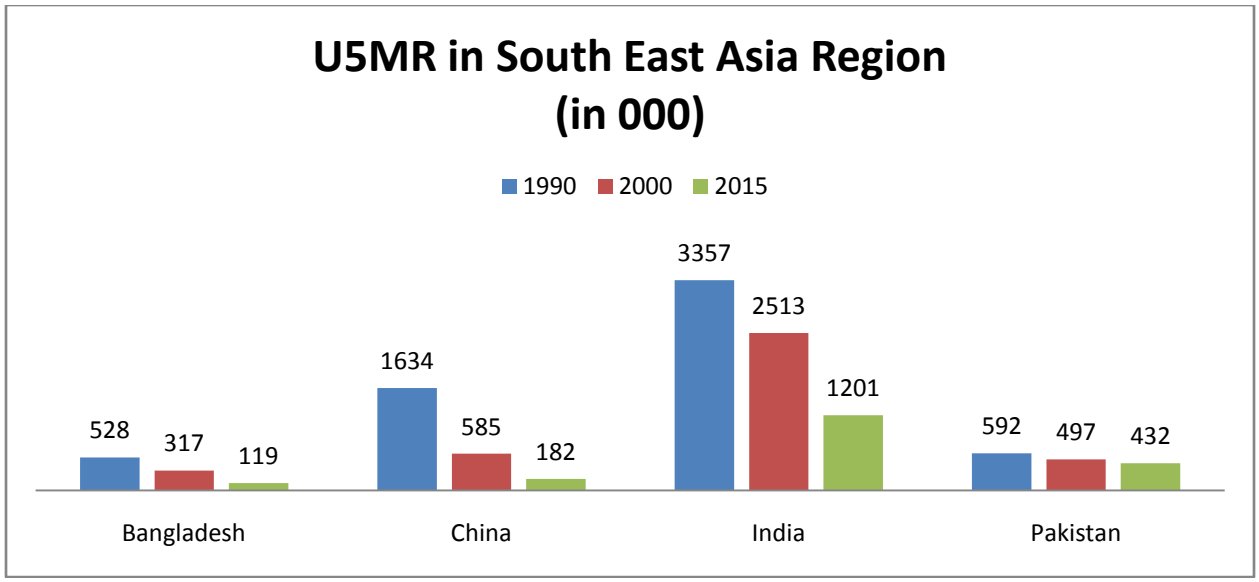
U5MR IN SOUTH EAST ASIA REGION

The U5MR is consistently falling in the South East Asia region since the benchmark of the year 1990. In India, under-five deaths (in 000) which was 3357 in 1990 dropped to 2513 in 2000 and further dropped to 1201 in 2015.Similarly, for China these figures are 1634 in 1990, 585 in 2000 and 182 in 2015. Talking about Pakistan, these figures stood at 592 in 1990, 497 in 2000 and 432 in 2015 whereas for Bangladesh these figures are 528 in 1990, 317 in 2000 and 119 in 2015.

Table 2: Under-five Deaths in South East Asia Region (in 000)

Country	1990	2000	2015
Bangladesh	528	317	119
China	1634	585	182
India	3357	2513	1201
Pakistan	592	497	432

Source: Unicef Inter-agency Group for Child Mortality Estimation (UNIGME)



HISTORICAL & PROJECTED TRENDS OF IMR & U5MR IN INDIA

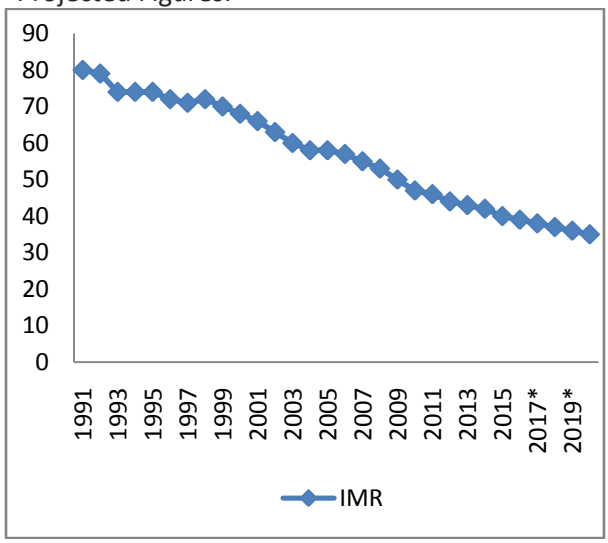
There has been a consistent decline in IMR and U5MR in India. During 1991 the IMR was 80 per 1000 of live birth which declined to 68 in 2000 and further it declined to 47 in 2010. The targeted IMR is 35 per 1000 live birth in 2020. Similarly during 1991 the U5MR was 115 per 1000 live birth which declined to 87 in 2000 and further it declined to 59 in 2010. The targeted U5MR is 43 per 1000 live birth in 2020**.**

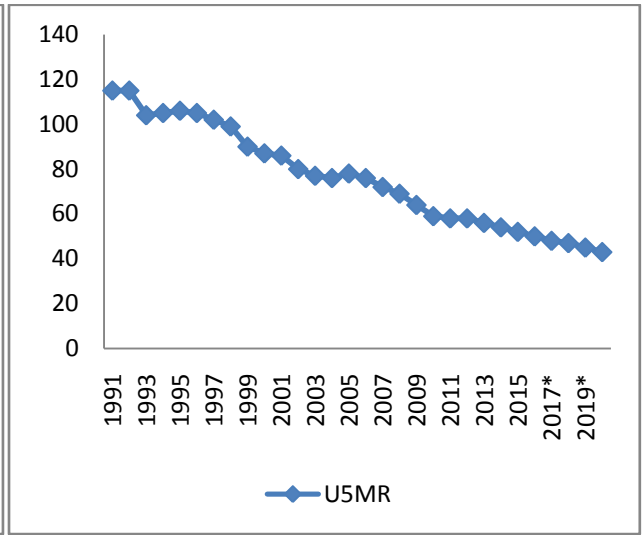
Table 3: IMR & U5MR in India 1991-2020

Year	IMR per 1000 live births	Year	IMR per 1000 live births	Year	U5MR per1000 live births	Year	U5MR per1000 live births
1991	80	2006	57	1991	115	2006	76
1992	79	2007	55	1992	115	2007	72
1993	74	2008	53	1993	104	2008	69
1994	74	2009	50	1994	105	2009	64
1995	74	2010	47	1995	106	2010	59
1996	72	2011	46	1996	105	2011	58
1997	71	2012	44	1997	102	2012	58
1998	72	2013	43	1998	99	2013	56
1999	70	2014	42	1999	90	2014	54
2000	68	2015	40	2000	87	2015	52
2001	66	2016*	39	2001	86	2016*	50
2002	63	2017*	38	2002	80	2017*	48
2003	60	2018*	37	2003	77	2018*	47
2004	58	2019*	36	2004	76	2019*	45
2005	58	2020*	35	2005	78	2020*	43

Source: Unicef, National Institute of Medical Sciences,Indian Council of Medical Research

*Projected Figures.

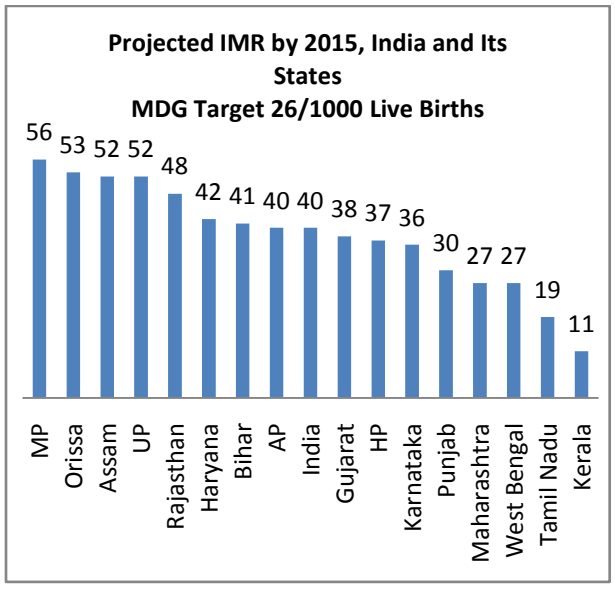


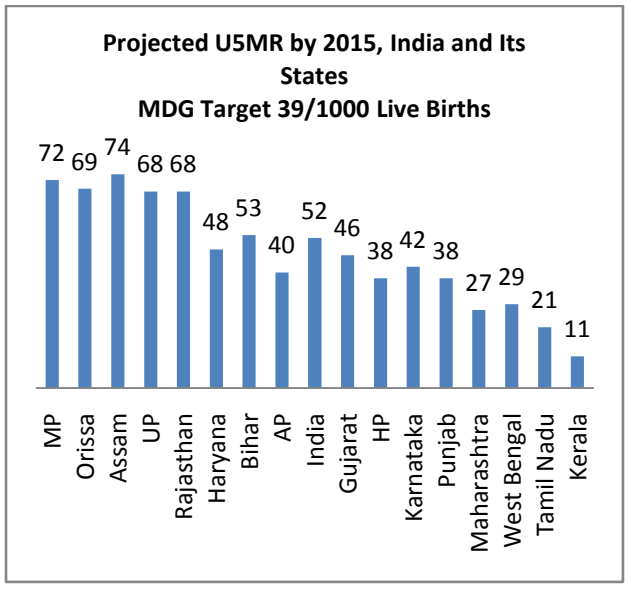


Source: Unicef, National Institute of Medical Sciences,Indian Council of Medical Research

IMR & U5MR IN INDIA: STATE WISE

The target of IMR (26/1000 live birth) and U5MR (39/1000 live birth) of MDG-4 are likely to be achieved by six states of India i.e. Tamil Nadu and Kerala (South), Maharashtra (West), West Bengal (East) and Punjab & Haryana (North).





Source: Unicef, National Institute of Medical Sciences,Indian Council of Medical Research

ASSOCIATION BETWEEN GDP AND IMR

One of the indicators of economic development of a country is that there should be negative association between GDP and IMR which means IMR should decline with the growth of GDP. Therefore it becomes imperative to study association between GDP and IMR in India. For this purpose data for the period 2001-2014 has been taken.

Year	Log GDP	IMR per 1000 live births
2001	6.3934	66
2002	6.4099	63
2003	6.4433	60
2004	6.4729	58
2005	6.5123	58
2006	6.5519	57
2007	6.5906	55
2008	6.6188	53
2009	6.6548	50
2010	6.6918	47
2011	6.7199	46
2012	6.7390	44
2013	6.7590	43

Source: CSO, Data Book for PC 22 Dec, 2014 RBI's Bulletin March 2015, Unicef, National Institute of Medical Sciences,Indian Council of Medical Research.

SPSS OUTPUT FILE:

Correlations

		Log GDP	IMR
Log GDP	Pearson Correlation	1	**-0.986****
	Sig. (2-tailed)		.000
	N	13	13
IMR	Pearson Correlation	**-0.986****	1
	Sig. (2-tailed)	.000	
	N	13	13

**. Correlation is significant at the 0.01 level (2-tailed).

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	428.813	18.974		22.600	.000
	Log GDP	-56.974	2.883	-.986	-19.765	.000

a. Dependent Variable: IMR

- There is negative and high association between GDP and IMR in India as correlation coefficient is -0.986 indicating the fact that with the growth of GDP there is decline in IMR and this association is **significant** as p-value 0.00 is less than level of significance.
- The regression equation of IMR(Y) on GDP(X) is ***Y= 428.813-56.974X*** and the regression coefficient of IMR on GDP -56.974 is significant as p-value 0.00 is less than level of significance.

CHILD SURVIVAL IN INDIA: ITS DETERMINANTS

a) Maternal and Demographic Determinants

- Education is the major factor affecting child survival in India. According to an estimate, children born to mothers with at least 8 years of schooling have more chances to survive. IMR and U5MR among children born to illiterate mothers have been consistently higher than those born to mothers with any education. The association between maternal education and child mortality is significant only when maternal education exceeds 8 years of schooling. As per an estimate, children born to mothers with at least 8 years of schooling have 32% lesser chances of dying in neonatal period and 52% lesser chances in the post-neonatal period as compared to the illiterate mothers.
- Age of the mother is another major factor affecting the child survival. Children born to adolescent mothers are at higher risk. IMR & U5MR are highest among mothers under 20 years of age.
- Spacing between childbirths also determines the child survival. The children born less than two years after the first delivery are less likely to survive. A short birth interval not only increases mortality risk of the subsequently born children, but also of those born earlier.
- The maternal nutrition status is yet another factor affecting the child survival. Mortality among children born to malnourished, anemic as well as obese mothers is higher.

- Professional health care also determines the child survival. The deliveries attended by health professionals have a lower risk. As per National Family Health Survey (NFHS-3) data, mortality rate is lowest for children delivered by health professionals (19.8/1000 Live Births) and was highest for the children delivered at home by traditional birth attendants (27.2/1000 Live Births).

b) Social and Economic Determinants

- The survey showed that the children born in SC and ST families have higher risk of dying than others. A child born to an SC family has 13% (19% for ST family) higher risk of dying in the neonatal period and 18% (45% for ST family) higher risk of dying in the post-neonatal period as compared to others.
- The economic status as measured by Standard of Living Index (SLI) showed that mortality among low SLI has highest decline i.e. 37.7% whereas high SLI household have shown the least decline. This is positive trend which shows that the gap between rich and poor is narrowing.
- IMR among girls has become equal to that among boys which shows that gender inequality is worsening.

c) Environmental Determinants

- Safe drinking water and access to improved toilet facilities also determine the child survival. IMR & U5MR are consistently lower among children living in families who have safe drinking water and improved toilet facilities as compared to those who do not have such access.

CONCLUSION

The upshot of the above is that 20% of world under- five deaths occur in India. India's under-five mortality rate (U5MR) for 2015 is about seven times higher than in some high-income countries, where 1 in 147 children died before their fifth birthday. One in every 21 children born in India is dying before the age of five, and one in every five under-five deaths in the world is an Indian's, but the brighter part is that India's U5MR has dropped 62% since 1990- from 126 deaths per 1000 live births to 48. This is higher than the average global reduction of 53%. The need of the hour is that there are certain areas of concern to address to accelerate the progress towards achieving MDG-4 by 2015such as:

- There exist large inequities in U5MR across states and between social and economic groups. But the brighter side of the picture is that there are some evidence of reduction of social and economic inequalities over the past two-three decades.

- Various risk factors especially low level of maternal education (less than class 8), early childbearing (earlier than 20 years) and inadequate birth spacing (less than 24 months) are significantly associated with IMR and U5MR.
- The improvement in quality of prenatal care is required for improving child survival.
- The slower decline of U5MR in urban areas is alarming as with the increasing urbanization, these trends are likely to become increasingly significant in determining child survival in near future.

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