JETIR.ORG ISSN: 2349-5162 | ESTD Year : 2014 | Monthly Issue
JOURNAL OF EMERGING TECHNOLOGIES AND INNOVATIVE RESEARCH (JETIR)
An International Scholarly Open Access, Peer-reviewed, Refereed Journal

INEQUALITY IN REDUCTION OF CHILD MORTALITY IN INDIA

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Abstract

Since the implementation of MDGs and SDGs, India, like other countries worldwide, has succeeded in reducing the under-5 mortality rate significantly in absolute terms. It has succeeded in lowering the U5MR from 109 in 1993-94 to 42 per 1000 live births in 2019-21, dropping by 44 per cent. But this reduction is not evenly distributed among different sections of society in the various states. The state-level U5MR ranges from 5 deaths per 1000 live births to 60 deaths per 1000 live births. Apart from this, inequality in the reduction of under-five mortality is prevalent across socio-economic groups all over the states. The mortality is still higher among poor and backward classes of society in every state. The present paper examines the trend in inequality in reduction of chid mortality between rich and poor and among the SCs, STs and General categories. The data on under-five mortality has been taken from the National Family and Health Survey for the periods 2005-06 (NFHS-3) and 2019-21 (NFHS-5) for our analysis. The rate ratios have been calculated for India and all the states for two periods to measure relative inequalities between the poorest and richest wealth quintiles and between the society's backward and general classes.

The rate ratios at the national level have either increased or remained constant. At the state levels, rate ratios decreased for a few states. The majority of states show either increasing or stable rate ratios. This allows us to conclude that inequality in the reduction in U5MR prevails in India, both at national and state levels and this inequality has increased in some states over time.

Keywords: SDG, U5MR, wealth quintiles, social groups, rate ratio, health inequality.

Introduction

It has been almost twenty-two years since United Nations set the millennium development goals (MDG) and so by India, and more than seven years have passed since Sustainable Development Goals were set by the UN's Open Working Group (OWG). The MDG-4 and SDG-3 advocate reducing child mortality by improving child health worldwide. Globally, the under-five mortality has decreased from 12.6 million child deaths in

1990 to 5 million in 2020. The under-five mortality rate (U5MR), the probability of dying a child before its fifth birthday, was 93 per 1000 live births in 1990 to 37 per 1000 live births in 2020, dropping 60% under-five mortality (WHO, 2021) worldwide. This figure tells the success in reducing the U5MR, but the story is not pleasant for all the countries. As per the WHO report, in 2021, 54 countries, especially from Sub-Saharan and South Asia, have higher U5MR, and the progress in reduction is very unsatisfactory. They will not be able to achieve the SDG goal by 2030. There is an obvious disparity among the countries in reducing under-five mortality worldwide. There has been inequality in the reduction of child mortality among the nations. The U5MR tends to be higher for low-income countries than for high-income countries. The relative inequality in reducing child mortality in most countries has increased or remained constant (Chao et al. 2018).

India, being a member of the UN, has also implemented the MDGs and SDGs. It successfully reduced the U5MR from 109 in 1993-94 to 42 per 1000 live births in 2019-21. But it is still far from its target of reducing U5MR to as low as 25 by 2030. And this reduction is not evenly distributed among different sections of society in the various states. The state-level U5MR ranges from 5 deaths per 1000 live births to 60 deaths per 1000 live births. Apart from this, inequality in the reduction of under-five mortality is prevalent all over the states.

The present paper aims to analyze the inequality in the reduction of under-five mortality in India. We have taken the data on under-five mortality of 25 states of India disaggregated based on wealth index and social category.

Data and Methods

The present study is based on secondary data from published data from the National Family and Health Survey (NFHS), series 3 (2005-06) to 5 (2019-21). The International Institute of Population Sciences and ORC Macro conducts NFHS and includes the demographic and health data of 29 states of India. NFHS provides essential data on health and family welfare and data on emerging issues in the healthcare sector. The main objective of NFHS was to collect reliable and up-to-date data on fertility, family planning, maternal health, child health and mortality. The five rounds of NFHS were conducted during 1992-23, 1998-99, 2005-06, 2015-16 and 2019-21, respectively. We have taken data on under-five mortality for our present study as an indicator of child mortality.

Using the published data on under-five mortality for two survey periods, 2005-06 (NFHS-3) and 2019-21 (NFHS-5) of 25 states of India, we have attempted to analyze the inequality that prevailed in the reduction of child mortality among socio-economic groups. To examine the inequality, under-five mortality data for the social category and different wealth indexes have been taken from 25 states. The rate ratio is used to describe the relative inequality in the reduction of U5MR. We have used three rate ratios R1 (ratio of mortality in poorest to the richest wealth quintile), R2 (ratio of mortality in SC to General category) and R3 (ratio of mortality in ST to General category). Inequality is considered to be increased or decreased over time if the rate ratio changes by at least 10%.

Inequality in Child Mortality

Child mortality is an important determinant of healthcare accessibility and is universally accepted as one of the best indicators of the health of the nation. The under-5 mortality has been taken as an indicator of child mortality because it provides the best means of capturing mortality risks during the most vulnerable years of childhood. Under-5 mortality is the probability of dying between birth and the fifth birthday. Child and under-five mortality rates are measured by the number of deaths per 1000 live births. The under-five mortality is the sum of infant and child mortality rates. The under-five mortality is preferred over infant mortality due to the fact that the former is an appropriate outcome measure for assessing the impact of various programs of government aimed at improving child health.

Table 1: Trend in level and inequalities (wealth quintile) in Under-5 Mortality in India and its states

India & States	Overall Under-five Mortality			Wealth Index and U5 Mortality				Poorest to Richest Inequality in U5 Mortality		
				2005-06		2019-21		Rate Ratio(R1)†		Change in Rate Ratio#
	2005-06	2019-21	% change in U5 Mortality	Poorest	Richest	Poorest	Richest	2005-06	2019-21	
India	**74.30**	**41.90**	**-43.61**	**100.50**	**33.80**	**63.40**	**19.40**	**2.97**	**3.27**	**Increase**
Andhra Pradesh	63.20	35.20	-44.30	93.90	44.80	29.16	10.25	2.10	2.85	**Increase**
Arunachal Pradesh	87.70	18.80	-78.56	102.00	*	24.29	9.76	*	2.49	
Assam	85.00	39.10	-54.00	129.10	23.90	43.26	18.90	5.40	2.29	**Decrease**
Bihar	84.80	56.40	-33.49	113.00	73.10	55.90	12.90	1.55	4.33	**Increase**
Chhattisgarh	90.30	50.40	-44.19	131.70	37.80	60.93	15.66	3.48	3.89	**Increase**
Delhi	46.70	30.60	-34.48	64.60[f]	31.90	0.00	18.06	2.03	*	
Gujarat	60.90	37.60	-38.26	122.70	39.60	44.26	20.52	3.10	2.16	**Decrease**
Haryana	52.30	38.70	-26.00	88.60[f]	40.00	45.20	21.45	2.22	2.11	
Himachal Pradesh	41.50	28.90	-30.36	64.00[f]	26.80	46.32	13.29	2.39	3.49	**Increase**
Jammu & Kashmir	51.20	18.50	-63.87	56.70[f]	29.00	22.80	14.47	1.96	1.58	**Decrease**
Jharkhand	93.00	45.40	-51.18	132.00	33.40	48.79	14.68	3.95	3.32	**Decrease**
Karnataka	54.70	29.50	-46.07	91.10	25.50	58.93	6.99	3.57	8.44	**Increase**
Kerala	16.30	5.20	-68.10	37.80[f]	13.40	*	3.67	2.82	*	
Madhya Pradesh	94.20	49.20	-47.77	125.30	41.70	53.92	28.67	3.00	1.88	**Decrease**
Maharashtra	46.70	28.00	-40.04	116.80	33.60	37.22	13.23	3.48	2.81	**Decrease**
Manipur	41.90	30.00	-28.40	69.90[f]	25.40	40.74	6.99	2.75	5.83	**Increase**
Odisha	90.60	41.10	-54.64	118.70	28.30	49.81	13.55	4.19	3.68	**Decrease**
Punjab	52.00	32.70	-37.12	53.40[f]	34.60	95.87	20.92	1.54	4.58	**Increase**
Rajasthan	85.40	37.50	-56.09	114.40	52.10	37.72	18.87	2.20	2.00	
Sikkim	40.10	11.00	-72.57	46.60[f]	34.90	77.77	0.00	1.34	*	*
Tamil Nadu	35.50	3.90	-89.01	65.70	27.30	*	0.06	2.41	*	*
Tripura	59.20	43.30	-26.86	73.40[f]	63.40[f]	49.79	130.16	1.16	0.38	**Decrease**

Uttar Pradesh	96.40	59.80	-37.97	135.40	61.80	66.44	33.78	2.19	1.97	**Decrease**
Uttarakhand	56.80	45.50	-19.89	116.30[f]	33.20	79.27	16.80	3.50	4.72	**Increase**
West Bengal	59.60	25.30	-57.55	80.40	23.80	28.59	6.86	3.38	4.17	**Increase**

Source: NFHS-3 & 5

[f]U5 Mortality is taken from available next higher wealth quintile
*The value is negligible or not calculable.
†Ratio of poorest to richest wealth index
#Rate ratio increases or decreases by at least 10%.

India succeeded in reducing the U5MR to 74.30 per 1000 live births in 2005-06 (NFHS-1) to 4 in 2019-21 (NFHS-5), recording a 44% decrease in fifteen years (Table 1). It is undoubtedly a significant improvement but still far away to achieve the target of achieving child mortality as low as 25 by 2030. Although there has been an absolute decrease in child mortality in all the states during the same period, one can find a regional disparity. The under-five mortality is the highest in Uttar Pradesh (59.8 deaths per 1000 births), followed by Bihar (56.4 deaths per 1000 live births) and the lowest in Tamil Nadu (3.9 deaths per 1000 live births). The percentage fall in U5MR also varies from as low as 20% in Uttarakhand to as high as 89% in Tamil Nadu. This inequality seems to increase or remain same over the years.

The disparity within the state is measured by rate ratio by taking two variables: wealth index and social category. The rate ratios measure the relative inequality among households, ranked by wealth index and divided into different social classes. The NFHS has ranked the households in five wealth index categories, viz. Poorest, Second, Middle, Fourth and Richest wealth quintiles; and have divided households into four social categories, viz. scheduled caste (SC), scheduled tribe (ST), other backward class (OBC) and others (GEN). In view of the purpose of our study, we have taken data on the poorest and richest wealth quintiles and SC, ST and GEN categories only. The rate ratio for the wealth index, denoted by R1, is the ratio of child mortality from poorest to richest. Two rate ratios for the social category are R2 and R3, defined as the child mortality ratios of the SC to GEN category and ST to GEN category, respectively.

India's national U5MR is always higher for the poorest wealth quintile in both 2005-06 and 2019-21 (Table 1). Rate ratios for both periods take a value of more than 1, revealing the discrimination against the poorest wealth quintile. At the same time, the rate ratio has increased by more than 10% between the two survey periods. At the state level, the story is the same. All the states have a value of rate ratios of more than one in both survey periods. Comparing rate ratios in two periods, it is evident that inequality has increased by 10% or more in 10 states. Therefore, it is clear from rate ratios that discrimination against the poorest section and inequality in reducing child mortality is prevalent in India at national and state levels.

Table 2: Trend in level and inequalities (social category) in Under-5 Mortality in India and its states

India and States	**Category wise Under-5 Mortality**						**Rate Ratio**				**Change in Rate Ratio@**	
	2005-06			**2019-21**			**2005-06**		**2019-21**			
	SC	**ST**	**GEN**	**SC**	**ST**	**GEN**	**R2**	**R3**	**R2**	**R3**	**R2**	**R3**
All India	**65.4**	**53.8**	**42.1**	**48.9**	**50.3**	**32.8**	**1.55**	**1.28**	**1.49**	**1.53**		Increase

Andhra Pradesh	96.1	112	63.2	40.1	32.7	17.8	1.52	1.77	2.25	1.84	Increase	
Arunachal Pradesh	*	100.9	78.6	NA	1.9	22.1	NA	1.28	NA	0.09		Decrease
Assam	110.7	83.2	100.9	42.2	41.3	38.3	1.10	0.82	1.10	1.08		Increase
Bihar	113.1	NA	108.9	59.2	68.4	53.7	1.04	NA	1.10	1.27		
Chhattisgarh	78.1	128.5	109.3	55.3	67	33.8	0.71	1.18	1.64	1.98	Increase	Increase
Delhi	51.3		43.2	31.5		29.1	1.19	0.00	1.08	0.00		
Gujarat	86.6	115.8	55.7	58.1	41.6	27.5	1.55	2.08	2.11	1.51	Increase	Decrease
Haryana	73.9	NA	49.7	43.5	NA	30.2	1.49	NA	1.44	NA		
Himachal Pradesh	63.4	*	33.1	32.8	26.7	28.2	1.92	NA	1.16	0.95	Decrease	
Jammu & Kashmir	72.2	*	53.3	17.1	33.2	16.1	1.35	NA	1.06	2.06	Decrease	
Jharkhand	121.3	138.5	92.7	57.2	55.8	27.1	1.31	1.49	2.11	2.06	Increase	Increase
Karnataka	65.4	77.9	60.4	33.9	35.6	15.6	1.08	1.29	2.17	2.28	Increase	Increase
Kerala	*	*	20.7	4.1	NA	3.6	NA	NA	NA	NA		
Madhya Pradesh	110.1	140.7	79.9	60.5	54.6	45.4	1.38	1.76	1.33	1.20		Decrease
Maharashtra	50.2	69.8	47.4	28.2	37.3	26	1.06	1.47	1.08	1.43		
Manipur	*	71.4	37.9	NA	26.2	24.7	NA	1.88	NA	1.06		Decrease
Odisha	91.8	136.3	64.2	39.7	66.2	28.3	1.43	2.12	1.40	2.34		Increase
Punjab	61.5	NA	50.5	38	NA	22	1.22	NA	1.73	NA	Increase	
Rajasthan	123.1	113.8	69.9	43.8	51.6	36.2	1.76	1.63	1.21	1.43	Decrease	Decrease
Sikkim	*	35.9	59.9	NA	NA	NA	NA	0.60	NA	NA		
Tamil Nadu	48.3	*	*	29	NA	NA	NA	NA	NA	NA		
Tripura	83.9	*	56.9	24.4	61.9	36.9	1.47	NA	0.66	1.68	Decrease	
Uttar Pradesh	135.1		87.7	70	64	50.8	1.54	NA	1.38	1.26	Decrease	
Uttarakhand	97.3	*	52.2	52.7	NA	26.4	1.86	NA	2.00	NA		
West Bengal	46.6	*	70.4	26.2	26.7	24.3	0.66	NA	1.08	1.10	Increase	

Source: NFHS-3 & 5

*The value is negligible or not calculable.
@ Rate ratio increases or decreases by at least 10%.
R2 is the ratio of SC to GEN category
R3 is the ratio of ST to GEN category

Now looking at the situation of under-five mortality for the survey periods 2005-06 and 2019-21 by social category, national U5MR is higher for SC and ST as compared to the GEN category in both periods (Table 2). The values of rate ratios (R2 and R3) are higher than 1 showing inequality in U5MR between SC and GEN and ST and GEN categories. Comparing rate ratios between the two periods, the change in R2 is insignificant, whereas R3 has changed by more than 10%, revealing that inequality in the reduction in U5MR has increased between ST and GEN during the period. The U5MR is also higher for SC and ST categories at the state level. The value of rate ratios R2 and R3 for almost all the states is higher than 1 in both survey periods, showing the discrimination against SC and ST categories. Out of 25, only five states show decreasing R2, seven show increasing R2, and eight show no change in R2 during the given period. The rate ratio R3 has decreased for five states, increased for five states and shows no change for eight states. The change in the rate ratios R2 and

R3 reveals that there is still inequality between SC and GEN and ST and GEN categories. There has not been a significant reduction in inequality in a reduction in U5MR in India, both at national and state levels.

Conclusion

The U5MR in India has decreased over time in absolute terms, but it is still far from the SDG 2030 goals. The absolute decrease in under-5 mortality by 44% between 2005 to 2021 could not guarantee an equal reduction in all the states as the U5MR in the highest mortality state is 15 times higher than the lowest one. Rate ratios, which measure the relative inequality for wealth index and social category, provide evidence to conclude that the reduction in inequality has not been evenly distributed to all sections of society in almost all states. At the national level, the rate ratio, R1, has increased, showing that the inequality in the reduction of U5MR between the richest and the poorest wealth quintile has increased over time. At state levels, R2 has decreased for only 9 out of 25 states, increased in 11 states and remains the same for the rest five states. This proves that inequality in the reduction of U5MR has either increased or remains the same over the period.

The rate ratio, R2, takes a value over one and does not change over time at the national level, indicating the persistent inequality in the reduction of U5MR between the SC and GEN categories. Out of 25, only five states show decreasing R2, seven show increasing R2, and eight show no change in R2 over the period. This again proves that there is prevalent inequality in the reduction of under-5 mortality between the SC and GEN categories. The rate ratio, R3, has increased at the national level over time. R3 has decreased for five states, increased for five states and shows no change for eight states. Constant and increasing R3 suggests that there is inequality in the reduction of under-five mortality between ST and GEN categories at both state and national levels.

From the above findings, we can comment that improvement in U5MR, following MDG and SDGs, does not guarantee the decreasing inequalities in mortality between the rich and poor, between SC, ST and GEN categories of the society. This indicates the importance of monitoring under-5 mortality among different socio-economic groups in the country by the government. It can also be argued here that there should be an incorporation of equity dimension into the SDGs. The government should adopt some policies that tackle health inequalities.

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