

# Infant and Child Mortality in India: An Analysis based on geographic regions

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## Abstract

In the demographic literature in the country the studies pertaining to the intricate interplay between female literacy, poverty, child malnutrition and child mortality are quite few and far between. The recent focus which was thrust on Millennium Development Goals 4 (Child Survival) and 5 (Maternal Health) has made the scholars study whether the geographic regions that were underprivileged and underserved in terms of female literacy, wealth, safe delivery or child nutrition were also grappling with the issue of enhanced risk of child mortality or whether there were any spatial contours defining these issues. The present research study makes a serious attempt to investigate these critical and important issues using the data from household surveys like NFHS 1992-1993, NFHS 1998-1999 and DLHS 2002-2004.

**Keywords:** literacy, poverty, child malnutrition and child mortality

The studies pertaining to classical demography and epidemiology which examined the level and the determinants of child and infant mortality in the developing countries have concentrated largely on the factors related to child survival and have ignored to a great extent the important dimension of geographic space is an important and independent variable which governs the risk of child and infant deaths. Those studies have examined the contribution of household level, maternal level and child level risk factors of infant and child survival, many studies have ignored largely the potential effect of the geographic space as a factor in contributing to the child survival. The few studies that have been made in this area are predominantly due to the classical survival models inefficiency that do not cater to the needs for such adjustments. The second most populous country in the world and the most populous nation in South Asia, India, contributes to the highest number of child deaths of the children below five years, that happen in the region (2.1 million deaths in 2016) and of about one-fifth of the child deaths of the children who are below five years, worldwide. The current mortality rate of a children who are under five years is alarmingly high in India when compared to the other countries which have same social and economic conditions as Indian has, in spite of the fact that significant progress has been made in infant and child mortality indicators in the country since the last two decades. The

improvements with regard to the infant and child mortality rates have been quite uneven and most of the child deaths occurred in the socially disadvantaged and marginalised sections of the population. To quote an example the infant mortality rate of the bottom 20% of the population, who are at the lowest rung of the economic ladder is nearly 2.5 times more than that of the richest 20% of the population who are the top end of the economic spectrum and this indicates that an infant who is born in a poor family which is at the lowest rung of the economic ladder faces 2.5 times higher possibility of death in infancy when compared to an infant who is bought in the economically better off family. It is not only the socio-economic disparities which are glaringly high, the disparities are equally conspicuous among regions as well; the northern states of the country have higher levels of infant mortality rates when compared to the western and southern states of the country. Even the disparities between different regions in the same State are also quite stark and marked.

The malnutrition which goes hand-in-hand with poverty exacerbate the possibility and the risk of infants and children getting exposed to various infectious diseases like pneumonia and diarrhea and enhance the probability and possibility of death, especially in relation to the children who have low birth weight. The fact the low female literacy, the poor economic status of the households, women married at an early age, nutritional status of mothers, low autonomy of women, large family size and lack of proper access to health care services result in disproportionately higher risk both for the health conditions of the children and their mothers has been well documented in demographic and epidemiological studies. Regional variations have also their influence and act as determinants of the infant and child survival. The marginal decline with regard to the proportion of population of the poor living under abysmal and poverty conditions in India from 36% in 1992-1993 to 27.5% in 2005-10 has not been consistent across different states and population subgroups but there are variations both with regard to States as well as different population subgroups. The percentage of the children who were underweight declined on an average only by 12% and on the other hand the proportion of the population which was living in abject poverty declined by over 24%. In States like Uttar Pradesh, Bihar, Rajasthan and Madhya Pradesh the under nutrition among the children is quite conspicuous and most pronounced, with more than half of the children being either stunted or underweight. Nearly 50% of the children who belong to the states of Maharashtra, Orissa and West Bengal are underweight and on the other hand 50% of the children who are living in a Haryana and Assam are stunted. The utilization and implementation of safe delivery methods among the mothers in the country has increased by 15% points (from 26% in 1992-93 to 41% 2002-04). However, the scenario in the country presents a glaring regional divide in the use of safe delivery methods in the country. The important role that is played by the geographic space in contributing to the demographic behaviour has been brought to light by a number of demographic studies. Most of the demographic studies did not pay adequate attention to the important effect of geographic space and instead they have focused only on the issue of infant and child mortality by studying only issues pertaining to community level, household level and individual level.

Such analysis lends the opinion that the relationship that exists between mortality and economic deprivation is both uniform and homogenous across space. However the studies which are made to examine the relationship between mortality and deprivation with relation to space have come out with different findings. While some studies came out with findings which advocated homogeneity over space, there were other studies which came out with findings which supported heterogeneity across space. So, while looking the spatial correlation it may or may not influence the results of the model depending upon the magnitude of the correlations over a period of time.

## Discussion

The National Population Policy (2000) and the The National Health Policy (2002) have conceived of reducing infant mortality to 30 per thousand by the year 2010. It has been suggested that there has been a decline in child mortality rate from 67 per 1000 in 1992-93 to 27 per thousand in 2002-04, the decline has not met the objectives and goals that were earlier envisaged and need to be achieved. It was suggested that the decline is not only slow but there existed disparities in such declines across the different geographic parts of India. While some geographic regions have displayed and achieved very low levels of mortality rates, there were other regions in the country which have presented a considerably high levels of child mortality. The big concern is the fact that certain pockets of the country have witnessed the clustering of the mortality. The data that has been collected through various studies stands witness to the fact that the country has not achieved equitable levels of declining mortality across the various regions of the country. An important and the key component of the analysis was that it could generate poverty estimates over the three survey rounds. Two different methodologies were used to create the poverty estimates. Initially the two rounds of NFHS were used for estimating wealth quintiles and the second round of DLHS, and then were clubbed the lowest two categories together and coded the rest for. Secondly, poverty estimates were created using NSS data from the 55<sup>th</sup> (1999-2000) and 61<sup>st</sup> (2004-05) rounds by using the project that was adopted by the Government of India to produce poverty estimates. The intention was to use the NSS poverty estimates the present study, however that could not be achieved because of the unavailability of district codes in the 50<sup>th</sup> round of NSS data collection (conducted in 1993-94) which happened to be the closest round of NSS to the first survey (1992 and 93) it was not possible for the research to construct the poverty estimates for the different regions related to the first survey round (NFHS 1992-1993) due to the unavailability of district codes. Hence, the poverty's estimates were made based on data from the NFHS and DLHS for the sake of maintaining uniformity. However, the poverty estimates that were created using the NSS were utilised to check the reliable consistency of the poverty estimates that got from the NFHS and DLHS datasets. In addition to that the poverty estimates that are created from the NSS NSS data sets for examining the Association between the poverty and one hand and infant and under-five mortality after adjusting for the urbanisation, malnutrition, safe delivery and female literacy using NFHS (1998-99) and

DLHS (2002-04). It was observed from the findings that the results that were obtained using NSS poverty estimates were in tune with those that were obtained from using the poverty estimates that were generated using DLHS and NFHS datasets.

One of the major contributions of the study is that it was able to identify the hotspots (that is, the regions which have high-poverty and are accompanied by high infant and under-five mortality; high infant and under-five mortality and high child malnutrition) and cold spots (that is, the regions that had low poverty as well as low infant and under-five mortality; low infant and under-five mortality and high female literacy). There is a popular perception among the policymakers as well as the research is that the infant mortality and under-five mortality are higher in one group of states and are lower in another group of states. However this analysis shows that there exists a huge gap with regard to infant and child mortality even within the same states. This study makes abundantly clear the spatial contours where the poverty along with infant and under-five mortality are clustered, and where the child malnutrition and infant and under-five mortality are also clustered. It becomes quite evident from the findings that there are geographic regions that need not only immediate but also careful attention of the policymakers in the country intends to achieve the Millennium Development Goals (Goal 4). This study also makes it categorically clear for the first time that the geographic regions that were underprivileged with regard to child nutrition also had lot of likelihood to be disadvantaged in terms of not only infant but also under-five child mortality, in respect of the state to which they belong to.

Another important finding of the research study is the identification of those geographical regions that present inconsistent relationships between the outcome variables and exposure variables (that is, the regions which showed high poverty but had low mortality; the regions that depicted high malnutrition but lower rates of mortality). To quote an example, the South Coast of Andhra Pradesh showed atypical pattern where there was high incidence of poverty but there was low mortality; high child malnutrition on one hand and low mortality on the other and high percentage of safe delivery of the child but accompanied by high mortality. The South Plateau and North west plateau of Karnataka of Karnataka, though showed low poverty but had witnessed high infant and under-five child mortality. Likewise, the Kongunad, South East Coast and Nilgiri in Tamil Nadu presented a picture as to how there could be no child malnutrition but high mortality among the children during their infancy and early childhood. In order to have a thorough understanding of the factors that contribute to such a regular patterns in these geographical areas these regions require a carefully designed and committed studies. The focus was found wanting in the earlier studies which are conducted either in some parts of India or in the other parts of the world. Another finding of the study which really warrants our attention and concentration is the inconsistent with the irregular relationship that exists between the prevalence of malnutrition among children and their mortality during the stage of infancy as well as their early childhood. The widespread prevalence of the child malnutrition was associated both significantly and positively with child

mortality during the first as well as the last survey rounds, however it was highly insignificant in the second survey round. The main reason behind this is there exists no one-to-one correspondence between the mortality and the child malnutrition. There possibly exists a lag between the occurrence of the malnutrition in the children and their mortality during their infancy and early childhood. Another reason could also be the existence of mortality selection because the most undernourished children might have died previously and as a result they may have got eliminated from the sample pertaining to the undernourished children. Hence, it is highly necessary caution must be exhibited while understanding the relationship between the child malnutrition and the mortality of the children. In spite of these weaknesses, the findings are of great importance because they present the possibility of clustering of child malnutrition and the mortality of the children in certain geographic regions.

It is highly imperative on our part to pay attention to the fact that while the negative association between female literacy on one hand and mortality and the other is growing, the positive association between the poverty on one hand and the mortality and other is getting decreased day by day. With accentuating investments due to the heightened focus on a Government of India with regard to maternal and child care programs like Janani Suraksha Yojana which is under the aegis of National Rural Health Mission, the reproductive and Child Health programs and the programs associated with providing nutrition like the IC DS and the mid-day meal schemes along with it the availability of these programs to those people who are living the poverty line, there is every possibility that the line between the rich and the poor is getting blurred and does not really matter provided one has the capacity to procure Access with regard to the information pertaining to these programs and the deserving people strongly demand for such services from the government. The effect of literacy, especially female literacy, under these circumstances is likely to increase and the effect of the poverty of the poor people is likely to get reduced. However, the effect of poverty and deprivation on the child health should not be ignored and not be allowed to fade into oblivion. The Mahatma Gandhi National Rural Employment Guarantee Scheme which was kick started by the Government of India to ameliorate the suffering of the deprived sections of the countryside is both a positive and welcome step in containing poverty, especially in the rural areas. In addition to that the Food Security Bill that has been envisaged by the Government of India is going to provide real impetus to the public health of the people.

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