

Attaining the Millennium Development Goal for Child Health by Selected Indian States

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Extended Abstract

Background:

Child mortality is a serious public health concern in India. Though infant mortality rate has declined during the past three decades, it is still very high (68 per 1000 live births). Similarly, under 5 mortality (95 per 1000 live births) rate is one of the highest among the south-east Asian countries. Progress made by India is critical for attaining the global Millennium Development Goal (MDG) for reducing child mortality. A recent study highlights the wide disparity among Indian states and districts and points the urgent need for geographic focus in actions aimed at accelerating progress towards MDGs (World Bank, 2003). This study employs 6 major states of India including Tamil Nadu, West Bengal, Andhra Pradesh, Bihar, Uttar Pradesh and Rajasthan that are in different phases of demographic transition and that contribute half of India's total population. As infant mortality is a major contributor of under five mortality in India, using Registrar General of India's projections, we have first estimated absolute number of neonatal and post-neonatal deaths these states need to reduce for attaining MDG for child health separately for rural and urban areas. We have further analyzed the household data from 1998-99 National Family Health Survey (NFHS) from 6 major states of India in different phases of demographic transition and contribute to nearly half of India's population.

Objectives:

The objectives of this study are: 1) to project the number of infant deaths (neonatal and post-neonatal) need to be averted to reach MDG; 2) to understand the association of infant and child mortality with critical proximate as well as distal determinants in six major states of India.

Data:

We use data from Sample Registration System and Population projections for India and States, 1996-2016, Registrar General, India to project the childhood mortality trends in the selected six states separately for urban and rural areas, and estimate the acceleration required for achieving the MDG.

National Family Health Survey (1998-99) data of Andhra Pradesh, Bihar, Rajasthan, Uttar Pradesh, Tamil Nadu and West Bengal have been used for multivariate analysis to determine demographic, economic, social and health system factors.

Methods:

We have used Registrar's General of India's projected estimates (Registrar General of India, 1996) of rural and urban population of all six selected states up to 2016. An adjustment factor based on most recent Sample Registration System (Registrar General of India, 2001) is used to estimate Crude Birth Rates for rural and urban area. Annual rates of decline are estimated using the trends of Infant mortality Rates (IMRs) observed during the past years to project pessimistic scenario for IMR without any new interventions. However, to achieve the Millennium Development Goal, IMRs are estimated to reduce by two-thirds by the year 2016. The difference between these two provides the number of infant deaths to be averted to achieve the goal. Also as the interventions for reducing infant deaths vary by time of death, the estimated infant deaths are segregated into neonatal and post neonatal deaths based on the relationship observed during the past years (Registrar General of India, 1999).

Cox proportional hazard models have been used for neonatal, infant and child mortality analysis. We model the hazard rate as a function of the baseline hazard (h_0) at time t , and the effects of the independent variables.

$$h(t) = h_0(t) e^{\beta_1 x_1 + \dots + \beta_k x_k} \dots \dots \dots (1)$$

Results:

We estimate that a large number of Infant deaths need to be averted in all six states (ranging from 0.63 million in Tamil Nadu to 2.3 million in Bihar) for achieving the MDG. Most of these deaths will take place in rural areas and around three-fourths will occur in neonatal period.

The survival analysis results show a strong association of “parity” with neonatal and infant mortality across all the states studied. First born child experiences a higher risk while the second least. Then onwards the risk of mortality increases as the parity increases. “Birth Spacing” also has strong association with neonatal and infant mortality among the selected states except in Tamil Nadu. The likelihood of neonatal and infant death is significantly higher among women with less than 2 years space between two successive births.

Parity and birth spacing also demonstrate a strong association with child mortality in West Bengal, Bihar, Uttar Pradesh and Rajasthan while no such association is seen in the two southern states of Andhra Pradesh and Tamil Nadu. “Women’s education” and “household wealth” have shown association with neonatal, infant and child mortality in northern states of Bihar, Rajasthan and Uttar Pradesh while such association is not evident in southern and eastern states included in the study.

Physical access to health facilities did not seem to have much influence on reducing neonatal, infant and child mortality among rural residents. Only in Andhra Pradesh, access to private hospital has stronger association with infant mortality.

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