

Child mortality trends and determinants – policy implications for child survival in India

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Introduction

In 2003, about 2.2 million children under age 5 died in India which is the highest total of any country and about 20 percent of all child deaths globally. Where most children die is shown in Figure 1. Recent years have shown a slowing down in the decline in infant mortality rates in India, resulting in a departure from the longer-term trends (Claeson, Bos, et al 1999, 2000). The slowing down in child mortality decline in India has called for new approaches that go beyond disease- program- and sector – specific approaches. This paper provides an input to the debate about what, why and how to speed up the rate of decline and accelerate progress towards the child mortality Millennium Development Goal of India. This is a synthesis of analytical work done by the World Bank-WHO Child Health and Poverty Working Group, the Bellagio study group on child survival, the recent MDG analysis of trends and determinants discussed in the *Millennium Development Goals for Health; Rising to the Challenges* and on Bank analysis of child mortality in India (Victora, Wagstaff 2003; World Bank, 2004; Claeson, Bos 2000). Three issues are discussed:

- What do children die from in India?
- Why are some children at higher risk of dying than others?
- How can child survival rates improve?

1. What do children die from?

The epidemiological profile of child deaths in India. The overall trend in infant mortality rate since the early 1990s (Figure 2) shows a departure from the earlier more rapid rate of decline. The rates of decline in infant mortality rate (IMR) and underfive mortality rate (U5MR) are leveling off and departing from the rate of decline that is required for India to hit the Millennium Development Goal. However, there are marked variations between and within states (Fig 3), in both levels and rates of child mortality trends.

The epidemiology of child deaths in the developing world -- where almost all child deaths occur – can be categorized according to a few typologies (Black, Morris 2003). The India profile of cause-specific child deaths shown in Figure 4, is characterized by a large proportion of neonatal deaths, followed by deaths caused by diarrhea and pneumonia,

and by “other” causes, most of them injury. This is important to keep in mind since neonatal deaths require a different set of policies addressing both the health and nutrition of young women, mothers and their newborns. The relative proportion of neonatal deaths have increased in India as overall child and infant mortality level have decreased (Figure 5). Therefore, states in India, with low overall child mortality levels and where neonatal deaths make up a large proportion of deaths, might require different strategies and package of interventions than those where underfive mortality and post-neonatal deaths still make up the largest share of deaths.

The critical role that undernutrition play in underfive mortality in India, is shown in Figure 6. Malnutrition (mild to severe) is associated with about 60% of all childhood deaths globally (The Bellagio study group, 2003). There is a strong relationship between health and nutrition in childhood; malnutrition being both a major determinant of childhood illness and an outcome of the infectious and parasitic burden of children. Malnutrition increases the case-fatality rate, i.e., the likelihood that a child with an illness will die from that illness episode.

As estimated by the Bellagio study group on child survival, high impact health and nutrition interventions are available to deal with more than 60% percent of all childhood deaths. The question then is why these interventions are not available and effectively utilized by the children who would benefit the most from them.

2. Why are some children at higher risk of dying than others?

Socioeconomic inequities. Poor children are consistently at a disadvantage compared with children born to better off families (Wagstaff, Bustreo et al, 2004), as shown in Figure 7. They are more exposed to risks including inadequate water and sanitation, indoor air pollution, crowding and exposure to disease vectors. They are more likely to be undernourished and therefore at greater risk of severe disease, and they are more likely to suffer from more than one disease when ill. They are less likely to have access and use preventive and curative interventions, and those who do receive treatment are less likely to receive appropriate quality services. Socioeconomic inequities in child survival exist at each step along the path from exposure, to resistance, to care seeking and to effective treatment. As a result, poor children are more likely than their better off peers to die in childhood.

An analysis of DHS data, estimating the proportion of deaths that would be prevented by improving equity, shows that if every child in India had the same mortality level as the richest 20% quintile, the overall underfive death rate would be halved (Victora et al, 2003). Figure 8 shows how India compare with others countries with high child mortality burden in this regard.

The evidence for what works in reducing these inequities vary. Among the potential strategies are empowerment of poor women, behavior change of poor mothers, access to water and sanitation, increasing affordability and making facilities more accessible to

poor household, enhancing human and other resources in facilities serving poor communities, and improving user-friendliness or allocating budgets to be more relevant to the burden of diseases suffered by poor children (Victora, Wagstaff, 2004). Very little is known about large scale and sustainable implementation of these approaches (Wagstaff, Bustreo et al, 2004; Victora, Wagstaff et al 2003). Some of these factors are discussed below, in the Indian context, including what is known about coverage of health services, the influence of maternal education, water, sanitation and other household environmental factors, gender, and location of residence. The findings are based on analysis of demographic and health surveys, intervention studies and the econometrics carried out as part of the World Bank health MDG analysis. The contribution of other studies to our knowledge about child mortality and its determinants in India -- based on other methodologies and data sources -- are discussed in the other papers presented at the panel.

Access and use of health services. A review of the household coverage rates of selected child health interventions (using immunization, oral rehydration and children with acute respiratory illness seeking care as tracers) showed, as expected, that the states in India with lowest U5M range (<50/1000) had the highest coverage levels of these interventions; the states in the mortality range of 100 – 50/1000, also had coverage rates above the national median, while the states with the highest child mortality rates (>100) had the lowest coverage rates, below the national median (Claeson, Bos et al, 2000). The available household data indicate that access and use of maternal and child health interventions have played a significant role in lowering underfive mortality in India. If states with low coverage of high impact child survival interventions could be brought up to the same performance levels as states with high coverage levels, a significant progress would be made towards the MDG for child mortality. Figure 9 shows the inverse relationship between coverage of child survival interventions and infant mortality levels by states; the same inverse relationship exist between some maternal interventions and child mortality levels, Figure 10. Several studies have shown the marked differences in coverage between the poorest quintile and the richest within the same areas, for example the differences in immunization rates between different quintiles (Figure 11).

Maternal characteristics. Maternal characteristics also play an important role not only for birth outcomes but for child survival. Underfive mortality rates differ significantly by female education and nutrition, and the use of health services during pregnancy and delivery -- the most significant maternal factors in India for reducing child mortality rates according to the National Family Health Surveys 1992-1993 (Claeson, Bos et al, 2000).

So how can the education MDG contribute to the health MDGs in India? The education MDG calls for universal completion rates at primary level and it is likely that there will be accelerated progress towards that goal. However, as discussed in the MDG report: *Rising to the Challenges*, the payoff from primary education to the health MDG by the 2015 target date of 2015 is unclear. It is also unlikely that the educational attainment among women will have any effect on child mortality until 2010 and beyond. Even

beyond 2015, it is unlikely that increases in primary school completion rates will yield major pay offs in child survival. A multi-country study of DHSs have found that the effect of secondary education on health is stronger (World Bank, 2004) . And, better educated women achieve better health outcomes not by using health-specific knowledge acquired at school, but rather what they learn later in life. Several studies have shown the impact of counseling of mothers on behavior change and child health and nutrition outcomes, for example on exclusive breast feeding practices (Hill, Kirkwood 2000).

Water sanitation and the home environment. A recent meta-analysis (Fewtrell, Colford, 2004) commissioned by the World Bank joint working group on Water, Sanitation and Health (HNP and WSS) on the effectiveness of water, sanitation and hygiene interventions in reducing diarrhea, confirms the results of earlier studies by Esrey et al (Esrey et al 1985;1991; Esrey, Habicht, 1986; Blum and Feachem, 1983). As Figure 12 shows, the evidence for the influence of hygiene and sanitation on diarrheal diseases in childhood is the strongest. What is different in the recent review compared with the earlier studies is the importance given to water quality at the point of use. Not only are hand washing and other hygiene behaviors essential in order for water supplies to have an impact on health outcomes, but purification of water at the point of use is also found to be effective. The fact that behavior change interventions are important in order to maximize the benefits of water, is also shown by a study in India that estimated the effect of piped water on changes in probability of diarrheal diseases, by income quintile (Jalan, Ravellion, 2001). The study, Figure 13, shows no impact of piped water on diarrhea prevalence among the poorest quintiles while a 40 – 60% reduction was achieved among the better of.

The MDG analysis in the report *Rising to the Challenges* show that if the access to drinking water and sanitation goals are achieved, the underfive mortality rates would fall considerable. Achieving impact on child survival from multisectoral interventions, require a focus on high impact interventions, summarized in Table 14 (World Bank, 2004) This table also shows the most relevant sectors for improved child health outcomes and child survival. The combination of faster growth, achievement of gender and water goals would lead to child mortality declines although the estimates for the combined effect on maternal mortality in South Asia is even stronger.

Girls are at higher risk of dying than boys. Gender disparities in health are higher in south Asia than anywhere else in the world. A girl in India is more then 40% likely to die between her 1st and 5th birthdays than is a boy, Figure 15 (Claeson, Bos, Pathmanathan, 2000; Victora et al 2003). Child mortality in India would drop by 20% if girls had the same mortality rate as boys between the ages of 1 month and 5 years. The factors contributing to this vulnerability among girls are both environmental and behavioral. Girls are often brought to health facilities in more advanced stages of illness than boys, and they are brought to less qualified doctors when they are ill. Less money is spend on medicines for girls compared with boys, and the are less likely to receive treatment. A study in Punjab showed that the expenditures on health care during the first two years of life was 2-3 times greater for sons than daughters(Das Gupta, 1987).

The urban and rural gap is getting smaller. Child mortality rates in rural areas are still higher than in urban areas, but child mortality decline in urban areas has been slower than in rural, and as a result urban – rural mortality differentials have become smaller (Claeson, Bos 2000; Pandey 1998), figure 15. The challenge of reaching urban poor is a growing concern in many large cities.

The private sector. Poor people are not much different from better off when it comes to their expectations and care-seeking practices. They too seek care from private providers, often at a high out-of-pocket cost, and for poor quality services (De Soyza, Bhandari et al, 1998). The percentage of children treated outside of the public sector for their most recent episode of diarrhea or acute respiratory illness was over 80% (Gwatkin et al 2000; Axelson, Bustreo Harding, 2003). Any scaling up in coverage rates of child health interventions would have to include well defined roles for both the private and public providers of health services.

3. How can child survival rates improve?

3.1 Policy implications – lesson learned

The lessons learned for child survival in India is the need for state stratified strategies and the adoption of multisectoral approaches to achieve greater impact and accelerate progress towards the health MDGs. There is a need to target the major household and health systems bottlenecks for effective delivery and utilization of high impact interventions in order to scale up coverage of child survival interventions – to reach the poor and close the gender gap. Policy options for child survival include:

- To strategize by state and area. States with high U5MRs and slow decline need to strengthen the health systems, prioritize essential elements of child health and nutrition services (high impact interventions) and develop and expand community participation for the prevention and treatment of childhood illnesses (careseeking, compliance and preventive practices at the household level). States that have reached lower levels of U5MR but are experiencing a slowdown in the rate of reduction need to sustain programs outlined above, emphasize improved referral services (including obstetric services), and effective strategies for reducing neonatal mortality (through women’s nutritional status, comprehensive reproductive services and newborn care) and early child development programs. States with a large proportion of urban poor need to explore innovative approaches for the delivery of health services, work with private providers and NGOs to increase access to quality services.
- To adopt a multisectoral approach. The study “Reducing child mortality in India in the new millennium” suggested that for India to pick up and continue its earlier successful record in child survival, a multiprong approach would be an important option. A multisectoral approach would include female education and nutrition, increasing the use of health services during pregnancy and delivery, eliminating the gender gap in child health services and improving nutrition throughout the

lifecycle. A multidisciplinary approach to policy development would take into account epidemiology, demography, systems, economics and sociobehavioral analysis of child mortality; the many disciplines represented in this panel on child survival in India.

- To strengthen health systems, policies and institutions. The MDG analysis of the *MDGs for health; Rising to the Challenges* suggest that accelerated progress towards the MDGs require: strengthening of policies and institutions throughout and beyond the health sector; lowering the barriers facing households; improving service delivery through stronger accountability; tackling human resource and pharmaceuticals as major health systems bottlenecks; strengthening core public health functions; and, securing affordable and sustainable financing. These are some of the same key messages for how to make services work for the poor, from the World Development Report 2004, *Making Services Work for Poor People*, and identified in the assessment of public health functions in India (Das Gupta, Rani 2004). As shown in Figure 17, recruiting and retaining health workers is not just about money; what health workers in Andhra Pradesh want and what they get differ.

3.2 Towards a comprehensive child mortality policy and strategy package

This review suggests that there are some key principles and elements that make up a successful child mortality reduction strategy, although there are state and context specific issues that have to be tackled. Those key principles are: the design of an outcome driven child health agenda; defining a high impact intervention package – including multisectoral interventions; exploring alternative delivery strategies; involving private sector and communities; targeting bottlenecks, areas and programs; build in evaluation, operations and problem solving research, with a shift in the focus from “what to do” to “why and how to do it”.

3.3 How to do it in poor performing states?

An important challenge is how to expand coverage and accelerate progress towards the MDG#4 in poor performing states. The MDG analysis in *Rising to the Challenges* of poor performing countries suggest how to do it also in poor performing states within countries. It shows that measurable progress can be made even if the targets will not be achieved. It suggests that targeting resources to poor areas may benefit from nontraditional mechanisms for priority setting and implementation, such as social investment funds (Newman, Pradhan, 2002). Simply reallocating the budget towards primary care do not automatically result in higher payoffs; coupling expenditure reallocations with measures to improve performance of primary care facilities and district hospitals, and ensuring that households actually demand the relevant interventions might do the trick. Targeting specific programs, such as integrated management of childhood illness (Bryce et al, 2004) or a package of homebased neonatal care (Bang et al, 1999), are good examples of programs that may yield high returns to government spending at the margin (Santos, Victora, 2001). MDG analysis in India also support the conclusion that

the way the government spending is allocated across programs makes a difference to its impact on the MDG#4 (World Bank, 2003). There is also an equity case to be made and a public health rationale for targeting specific population groups, to disproportionately benefit the poor who disproportionately carry the burden of child mortality. Targeting spending to remove bottlenecks is another targeting mechanism for greater returns. Work has begun in India applying the marginal budgeting for bottlenecks approach (Soucat, 2002); several states in India (including Rajasthan, Orissa and Gujarat) have assessed their impediments to faster progress towards the reproductive and child health and nutrition goals, identified ways to remove the obstacles and estimated the cost and likely impact on the MDGs . The preliminary estimates are a 5% (Orissa and Gujarat) respectively 8% (Rajasthan) reduction in U5MR if spending rose by 10% in these states, by identifying and removing bottlenecks.

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