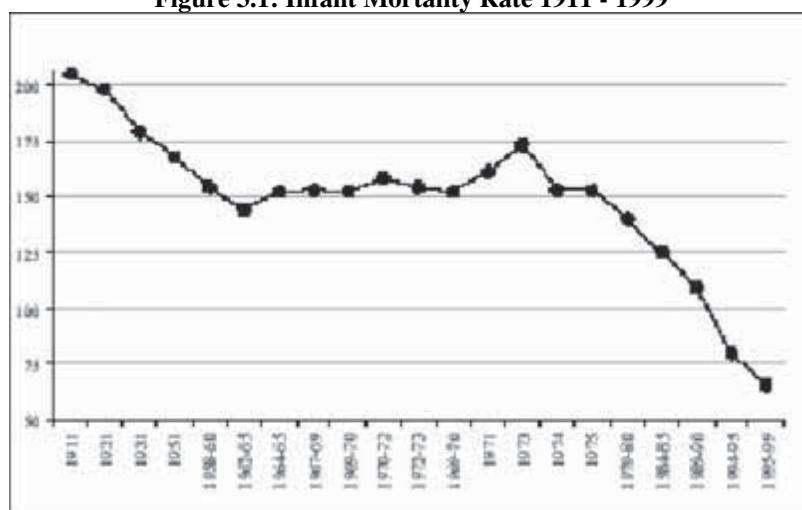


## CHAPTER 3: MATERNAL AND CHILD MORTALITY: TRENDS AND PROJECTIONS

### I. Trends

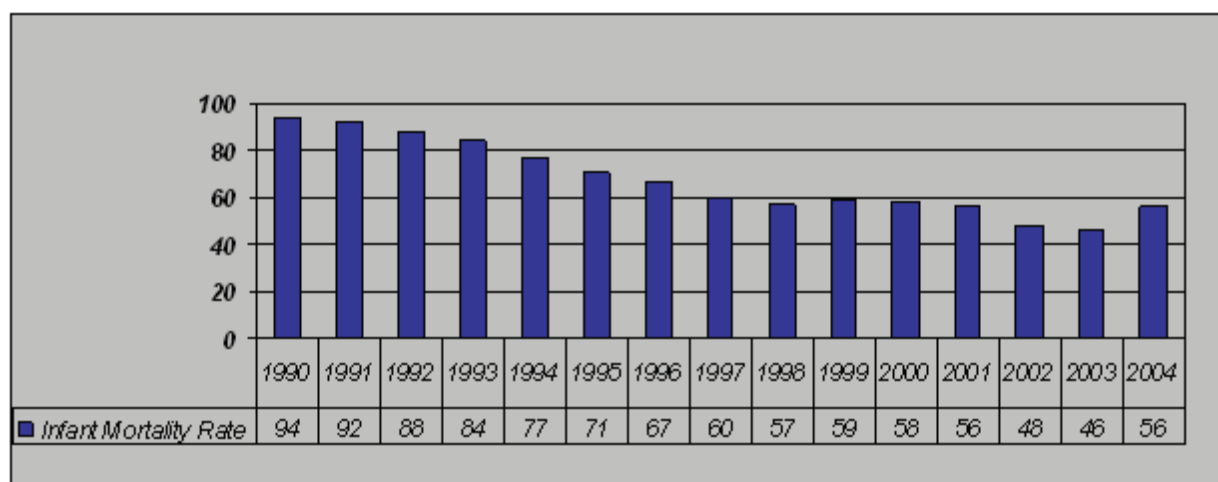
25. Child mortality is typically measured by two broad indicators, the infant mortality rate (IMR, 0-1 year) and the child, or under-five, mortality rate (0-5 years, CMR). Bangladesh has made remarkable progress in both measures over the past three decades. Figure 3.1 shows the evolution of infant mortality through most of the twentieth century. We see stagnation between the 1950s and early 1970s at around 165 infant deaths per thousand live births, followed by a sharp and sustained decline from 1975 that saw the rate plummet from 161 to 66 infant deaths today. Compared to India the decline has been much faster in Bangladesh, to the point where infant mortality is now lower in the latter despite a GDP per capita only half that of India.

**Figure 3.1: Infant Mortality Rate 1911 - 1999**



Source: *Attaining the Millennium Development Goals in Bangladesh* (2005)

**Figure 3.2: Infant Mortality Rate 1990 – 2004**



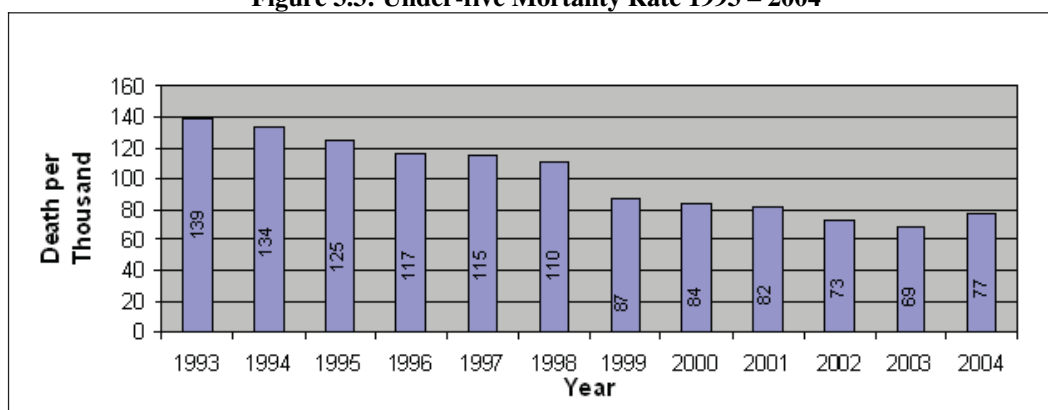
Source: *Millennium Development Goals, Bangladesh Progress Report* (2005)

26. Figure 3.3 shows progress in under-five mortality since 1993; mortality rates fell by almost half during this period, although the rate of decline has slowed considerably since 1999. Rural-urban

## Accountability and Institutional Innovation in Bangladesh

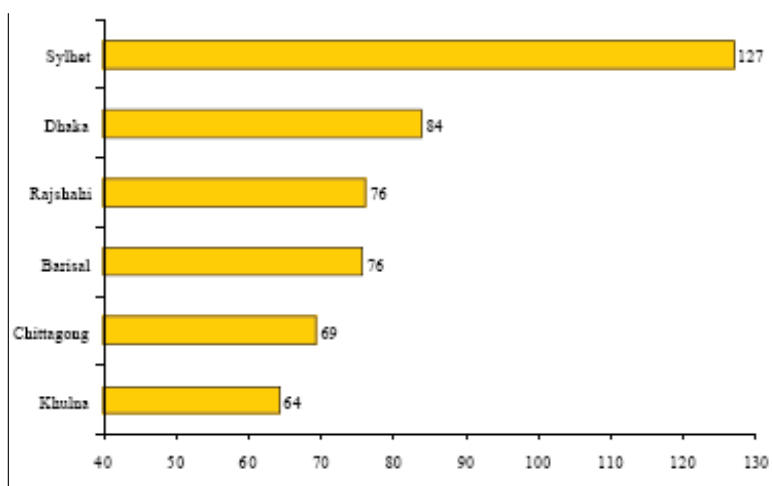
differences persist in 2001, with the rural rate (89) considerably higher than the urban rate (52). Indeed, spatial variation in mortality rates continue to be high across Bangladesh, despite recent progress. Figure 3.4 shows infant mortality rates across the country's different divisions, and the differences are striking. IMR in Sylhet division is twice that of Khulna. Curiously the capital, Dhaka, is second-highest. The region with the highest infant mortality rate in 1993/4—Dhaka—saw the slowest decline in that rate (14 percent) during the following six years. By contrast, Khulna, with lowest IMR in 1993/4, saw it fall twice as fast. Hence regional variations in IMR have become more pronounced across Bangladesh over time. Figure 3.5 suggests that such spatial variation is probably not due to exogenous geographic or environmental factors. A map of under-five mortality by district shows that those with the highest CMR are scattered throughout the country, and sometimes contiguous with the lowest-CMR districts. Absent structural changes in health care and nutrition, these spatial variations are projected to persist through 2015.

**Figure 3.3: Under-five Mortality Rate 1993 – 2004**



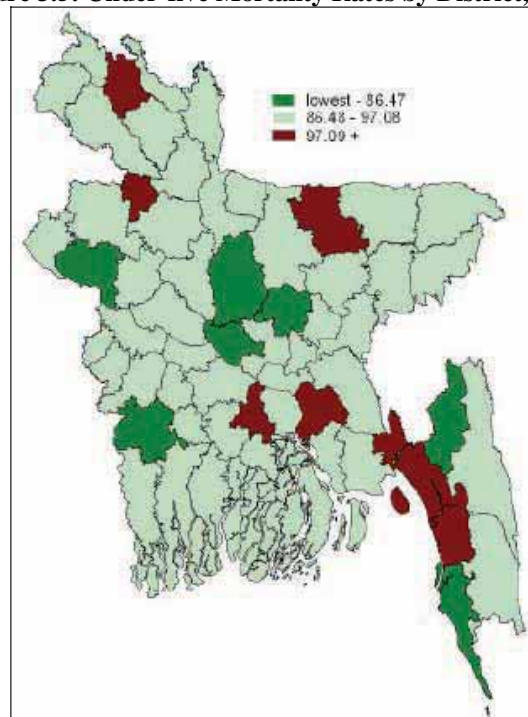
Source: Millennium Development Goals, Bangladesh Progress Report (2005)

**Figure 3.4: Infant Mortality Rate by Division 1999 – 2000**



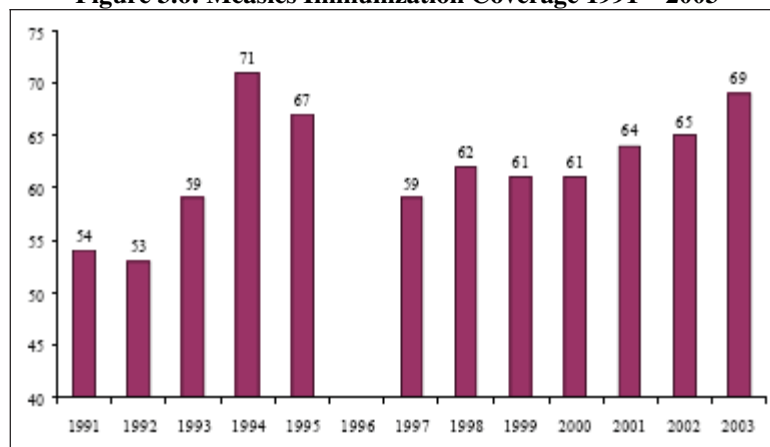
Source: World Bank 2005

Figure 3.5: Under-five Mortality Rates by District, 2000



Source: World Bank 2005

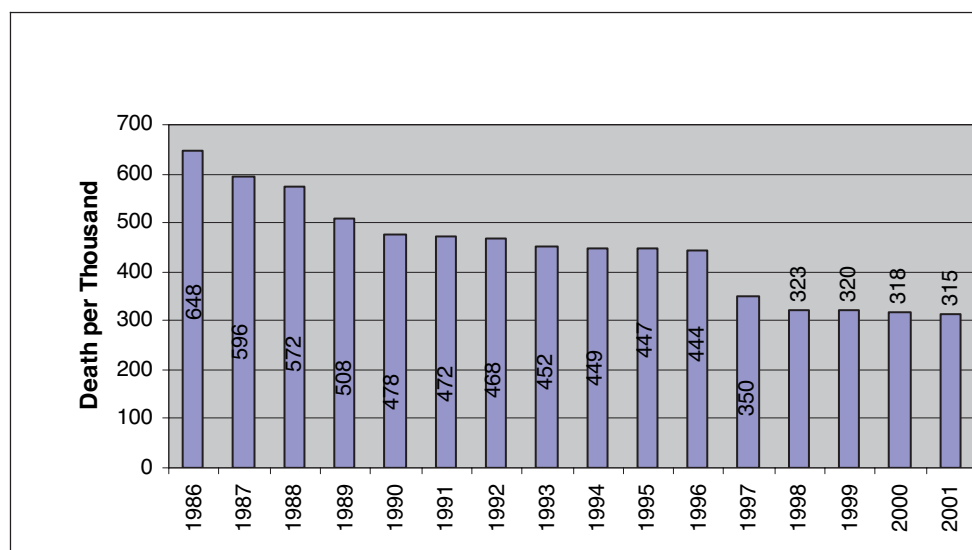
Figure 3.6: Measles Immunization Coverage 1991 – 2003



Source: World Bank 2005

27. Maternal mortality is usually tracked with a single indicator, the maternal mortality ratio (MMR), which is a measure of maternal deaths per 100,000 live births. Because the indicator is measured by reference to live births, the declining fertility rate in Bangladesh does not affect the overall level of MMR. It is important to note, however, that the declining fertility rate does mean that the average risk to women from maternal complications has been reduced, irrespective of the factors that affect the MMR. Here we focus on the MMR, as do the MDGs, because it captures the effects of both the demand and supply side of the system of maternal health service delivery. Figure 3.7 below presents data from UNESCAP, based on BBS data from the Vital Registration System, during the period 1986 to 2001. It is immediately apparent that Bangladesh has managed to reduce by more than half its MMR during the last 20 years.

Figure 3.7: Maternal Mortality Ratio 1986 – 2001



Source: UNESCAP using BBS data from the Vital Registration System.<sup>10</sup>

## II. Projections

28. Bangladesh has done well recently on both maternal and child mortality, in some cases surpassing its larger, richer neighbor India. How likely is it to meet the MMR and CMR goals by 2015? Recent quantitative analysis<sup>11</sup> shows that the determinants of recent trends in child mortality include:

- Strong economic growth that raises consumption expenditure per capita
- Increasing female education
- Increasing measles immunization coverage
- Increasing the age at which women begin reproduction.
- Reduction in fertility

No similar analysis has yet been done for maternal mortality. But the phenomena are quite similar, and we can assume broadly similar determinants for both mortality types. The first two factors are outside the health sector, while the latter two are within it. Hence it is useful to treat the two groups of determinants separately.

29. Economic growth in Bangladesh has been strong recently, and the trend is clearly one of improvement. The country is experiencing a sort of boom that may be modest by Asian standards, but is remarkable when compared to its own history. As was discussed above, per capita GDP growth more than doubled from 1.5 percent per year in the 1980s to 3.3 percent per year in the 1990s, and appears to have accelerated somewhat since 2003. Quantitative analysis shows that growth has been responsible for a good deal of the improvement in Bangladesh's social indicators in recent years, notably poverty,

<sup>10</sup> It should be noted that the accuracy of the data generated by the Bangladesh Bureau of Statistics' Vital Registration System has been called into question (ICDDR-B, 2005). Nevertheless, the VRS figures have been used here because they are the only source of annual data on maternal mortality that is nationally representative.

<sup>11</sup> World Bank, *Attaining the Millennium Development Goals in Bangladesh* (2005). The urban, female, and multiple birth variables are excluded from this list since they are not choice variables susceptible to policy interventions.

hunger, primary school enrolment, and child mortality. Hence it is of the utmost importance that growth be maintained and accelerated, in the interests of improving broad standards of living and welfare, and for the sake of meeting the MDGs. We return to the topic of how to increase growth in the next section.

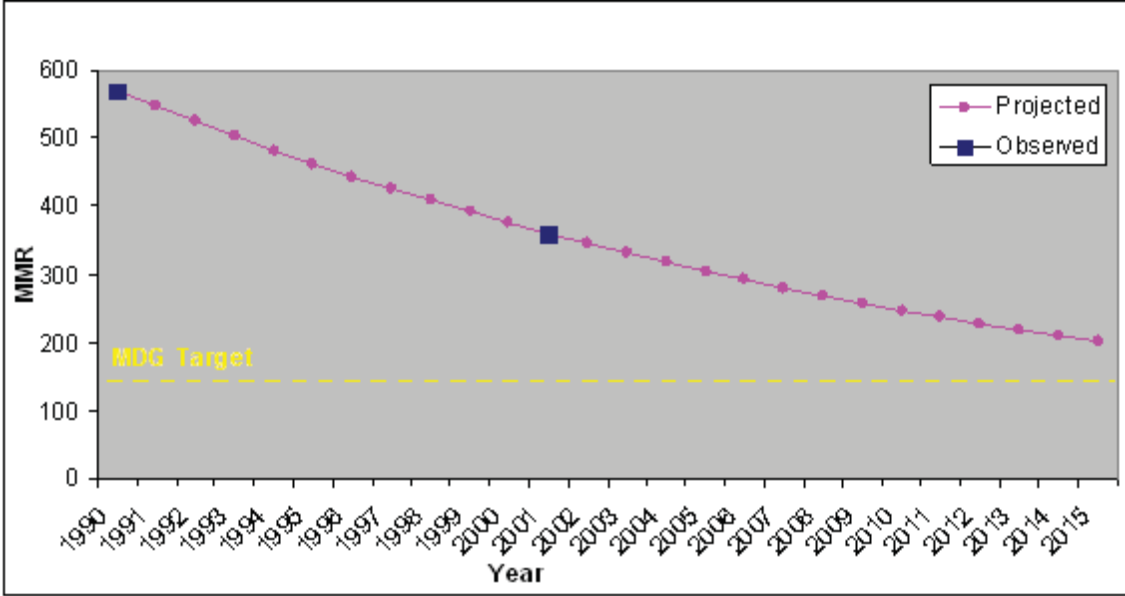
30. Bangladesh has made substantial progress in the education of girls in recent decades. With the Female Secondary School Stipend (FSSS) program, launched in 1994, female enrolment rose dramatically, from 1/3 of all secondary students in 1990 to just over half in 2000. This simple and highly effective tool is a form of conditional cash transfer that covers most school expenses incurred by girls in grades 6-10. A stipend is paid directly to an account established for each girl in a nearby commercial bank. Recipient girls are expected to pay miscellaneous school fees out of their stipends, while tuition assistance is paid directly to the schools involved. Stipends rise over time because extra incentives are needed to reduce dropout in higher grades. The program has additionally raised the number of teachers—especially women—in secondary school; provided occupational skill training to girls about to graduate; made schools more attractive, healthier and safer for girls; and strengthened government institutions for secondary education.

31. The FSSS appears to have been hugely successful in its main objectives of increasing the number of girls entering secondary school, and keeping them in school until graduation. Indeed, it has allowed Bangladesh to meet the MDG for gender equality in secondary education 15 years ahead of time. This is another instance of accelerated social progress in Bangladesh, an example for other developing countries, and an important policy tool that should be sustained in the medium term. It is also an example of how well-designed instruments of service provision can bring about significant changes in social outcomes, such as female education, despite little change in the underlying social norms and structures that are often thought to determine such outcomes.

32. Could Bangladesh meet the goals for MMR and CMR by 2015? Simulations based on the quantitative analysis cited above, given reasonable assumptions about changes in mean consumption per capita, adult female schooling, delayed child bearing among women, and expanded measles coverage, suggest that child mortality could decline substantially—by more than 50 percent—between now and 2015. The incremental contributions of measles vaccination and delayed child bearing to this decline are estimated at 15 and 11 deaths averted respectively. This implies the CMR would fall by 52 to 46 per thousand live births, and the MDG would be met roughly one year ahead of time. It should be noted that these are not *predictions*, but rather projections based on recent trends in the factors mentioned above continuing in a linear fashion through 2015. In particular, the model assumes per capita GDP growth rates of 4 percent per year, which is somewhat higher than growth recorded during the 1990s, but not radically so. The discussion in chapter 3, illustrates how Bangladesh can exceed this target quite easily.

33. Hence the child mortality targets can be met on current trends, though there is still a long way to go. Unfortunately the same cannot be said of maternal mortality. Bangladesh has one of the highest rates of maternal mortality in the world, and the strong advances recorded recently have nonetheless left it comparatively elevated. Quantitative models have not been estimated for maternal mortality, and hence we do not have detailed projections. But simple extrapolation of recent trends implies that this MDG will not be met. Figure 3.8 shows that maternal mortality fell from 574 deaths per 100,000 live births in 1990 to about 360 deaths in 2001, a fall of 37 percent. If we extrapolate this *rate* of decline, implicitly accepting that continued reductions become more difficult as the level of MMR falls, we reach a level of 227 deaths by 2015. If the rate of decline itself falls with the level, say to 25 percent, then the projected rate in 2015 will be 270. The two numbers are 59 percent and 88 percent higher, respectively, than the millennium target of 143.

Figure 3.8 : Estimated Maternal Mortality Ratio 1990 – 2015



Source: Authors’ calculations based on official data.

34. There is thus a need for a structural break in recent MMR trends—an exogenous “MMR shock”—of the sort observed for infant mortality after 1975. In principle, this could come from a variety of sources: fiscal, institutional, medical or educational, to name some obvious candidates. Both the analysis provided in *Attaining the Millennium Development Goals in Bangladesh* and the general principle of diminishing returns, in this case of particular policy instruments, imply that the most cost-effective solution will involve a blend of measures. In order to identify these, we must look inside the health care provision system, at its institutional features and technical parameters, to distinguish those aspects that work to improve mortality rates from those that do not. The persistence of high subnational variation in CMR performance in Bangladesh suggests that a comparative approach may well be fruitful. Why do some areas perform so much better than others? Why have a few NGOs managed radical improvements in maternal and child mortality, apparently without significant investments in infrastructure or equipment, relying instead on the same public health assets that as a rule perform much more poorly?