

## Neonatal infections in South Asia: challenges ahead



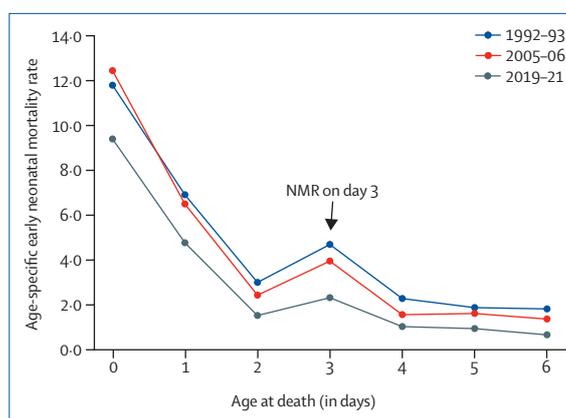
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India has the highest number of newborn deaths worldwide, with 0.5 million deaths within the first month of life annually; Nigeria, Pakistan, Ethiopia, and the Democratic Republic of the Congo together accounted for nearly half of the 2.4 million global newborn deaths in 2019.<sup>1</sup> Understanding the causes of neonatal infections (eg, bacterial or viral) is crucial to achieve further reductions in neonatal mortality among lagging populations, where infections are a major cause of all neonatal deaths. In *The Lancet Global Health*, Melissa Arvey and colleagues address this knowledge gap meticulously and help to identify the causes of infections and case management.<sup>2</sup> Arvey and colleagues did a population-based longitudinal study among young infants aged 0–59 days in Bangladesh, India, and Pakistan, aiming to describe the spectrum of infectious causes of acute neonatal illness categorised using the 2015 WHO case definitions of critical illness, clinical severe infection, and fast-breathing only. Arvey and colleagues found that the proportion of illness attributable to bacterial infection was 32.7% in the critical illness group, 15.6% in the clinical severe infection group, and 8.8% in the fast-breathing group; however, an infectious cause was not identified in 58–82% of these infants.

For future reductions in neonatal mortality, it is essential to develop simple procedures that facilitate the identification of critical cases among neonates and standardised operating procedures for management, in both clinical and community settings (eg, by health workers such as accredited social health activists [ASHAs] and auxiliary nurse midwives).<sup>3,4</sup> Most deliveries in India, Bangladesh, and Pakistan now occur in a health facility; however, discharge might happen earlier than recommended due to unavoidable reasons. The recent round of demographic and health surveys showed that 66% of all births in Pakistan<sup>5</sup> and half of all births in Bangladesh<sup>6</sup> in 2017–18 occurred in a health facility. In 2019–21,<sup>7</sup> 20% of women in India who had a vaginal delivery stayed in a health facility for less than 24 hours. For caesarean section deliveries, 12% of women stayed in the health facility for less than 3 days; this includes 4% of women who stayed for less than 6 hours. These proportions were much higher in Pakistan<sup>5</sup> and Bangladesh.<sup>6</sup> For example, in 2017–18, 84% of

women in Pakistan and 41% of women in Bangladesh who had a vaginal delivery stayed in a hospital for less than 24 h. Furthermore, 26% of women in Pakistan and 2% of women in Bangladesh who had a caesarean section delivery stayed in a health facility for less than 3 days.

To explore the potential implications of the facility-to-home transition in India, we analysed age-specific mortality rates for the first week after birth from five National Family Health Survey<sup>7</sup> rounds. Our analysis indicates that, in India, the age-specific mortality rates during the first week of life remained unchanged until 2005–06. The mortality rates showed notable improvement after 2005–06, when several innovations to improve maternal and newborn survival were introduced. However, a crucial point emerging from this analysis is that the mortality rate on day 3 is substantially higher than on day 2 in all the surveys, suggesting a poor transition of care from hospital to household (figure). This finding calls for special attention to the management of newborn health status when the newborn baby is moved from the health facility to the home. This attention is crucial, as the social settings (including maternal and household characteristics), are often poor among the vulnerable populations that continue to show higher neonatal mortality rates. Consequently, health system improvements might play a small role in future reductions in neonatal mortality in India. Multipronged efforts, including an effective, low-cost health system combined with a responsive



**Figure:** Age-specific early neonatal mortality rate in days per 1000 live births during the first week of life, India 1992–93 to 2019–21  
NMR=neonatal mortality rate.

programme for dealing with social determinants locally might need greater attention.

Given that the causal factors of neonatal infections do not have specific symptoms, identifying such factors is difficult. By using cohort data on infants aged 0–59 months (healthy controls and those with possible serious bacterial infection) in Bangladesh, India, and Pakistan, the Arvay study examines the relevance of WHO classifications of critically ill, clinical severe infection, and isolated fast breathing. The study highlights the limitations and non-specificity of the WHO case definitions for infectious causes of illness, and advances our understanding of infection among critically ill neonates in times when neonatal mortality reduction is a global challenge. This study is a crucial step in the right direction; however, more rigorous research is required in this area.

We declare no competing interests.

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