

Neonatal Resuscitation in Low-Resource Settings



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KEYWORDS

- Neonatal resuscitation • Birth asphyxia • Intrapartum-related events
- Low-income countries • Low resource • Resuscitation education

KEY POINTS

- Simplified resuscitation programs reduce fresh stillbirth and early neonatal mortality rates in low-resource settings (LRSs) where the burden of death is greatest.
- Goals set by the Every Newborn Action Plan call for national and global efforts to improve coverage and quality of neonatal resuscitation.
- The science of resuscitation demonstrates that more than 95% of babies will respond to simple steps of drying, stimulation, warmth, suctioning if needed, and bag-mask ventilation.
- Despite notable progress, barriers remain in access to resuscitation equipment, presence of a skilled provider at birth, and quality assurance in resuscitation training.
- Future efforts to advance neonatal resuscitation in LRSs need to consider preservice education, skills retention through refresher training or low-dose, high-frequency practice, as well as expansion of health information systems and quality improvement initiatives.

INTRODUCTION

Almost all newborn deaths occur in low-income and middle-income countries (LMICs) where access to health care, including resuscitation at birth, is limited. Data from the last 2 decades starkly contrast the 31 million neonatal deaths in South and East Asian LMICs and 21 million in African LMICs with the 1 million neonatal deaths occurring in high-income countries.¹ Estimates suggest almost one-fourth of neonatal deaths can be attributed to intrapartum-related events or what is commonly referred to as birth asphyxia.^{2,3} As a result, an estimated 720,000 deaths each year are thought to result from intrapartum-related events, although definitive causes cannot be confirmed.⁴

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Notably, studies suggest that the systematic implementation of low-cost and effective newborn resuscitation programs in low-resource settings (LRSs) has the potential to avert nearly 200,000 of these intrapartum-related deaths each year.^{5,6} In addition, an estimated 1.3 million intrapartum stillbirths occur annually; these deaths are potentially preventable by improved care during labor and at the time of delivery.⁷

Frequently quoted studies imply that 10% of infants require some support or stimulation at birth although only 3% to 6% of newborns require positive-pressure ventilation to initiate spontaneous respirations. An even smaller proportion (<1%) requires advanced care, including chest compression or medications (Fig. 1).^{5,8–10} However, these estimates are biased towards care in resourced or facility settings where high rates of prenatal care, fetal monitoring, and cesarean delivery reduce the prevalence and impact of intrauterine hypoxia. These data may greatly underestimate the need in low-resource environments where the burden of neonatal morbidity and mortality is highest.^{11–13} Studies from rural home deliveries in Zambia suggest 16% to 21% of infants require stimulation at birth, whereas unpublished data from community settings in Bangladesh imply even higher rates of need for intervention.¹¹

Although reduction of neonatal mortality calls for primary prevention through improved fetal monitoring and obstetric care, resuscitation and stabilization of nonbreathing infants alone have the potential to save lives.⁶ Studies have shown that even simple measures, including appropriate stimulation, clearing of the airway, and avoidance of hypothermia can reduce mortality.^{13,14} The addition of assisted ventilation when clinically indicated represents a simple and critical intervention to reduce both morbidity and mortality associated with birth asphyxia.¹⁵ Growing recognition of the burden of prematurity has included estimates implicating preterm birth as the direct cause of 35% of neonatal deaths.¹⁶ In partnership with access to special care, resuscitation education has potential to reduce this burden by supporting preterm infants who are at greatest risk of breathing problems at birth.

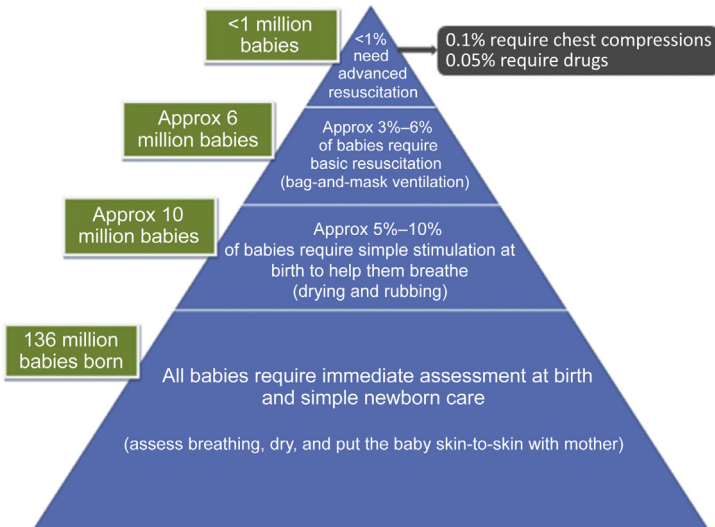


Fig. 1. Estimate of annual number of all newborns who require assistance to breathe at birth and varying levels of neonatal resuscitation. (From Lee AC, Cousens S, Wall SN, et al. Neonatal resuscitation and immediate newborn assessment and stimulation for the prevention of neonatal deaths: a systematic review, meta-analysis and Delphi estimation of mortality effect. *BMC Public Health* 2011;11(Suppl 3):S12.)

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