Globally, 3 million newborns die each year, and 2.6 million babies are stillborn. Four out of five newborn deaths result from three preventable and treatable conditions: preterm birth; infections; and complications during childbirth, also known as birth asphyxia. For more information on each of these conditions, visit the Health Newborn Network (http://www.healthynewbornnetwork.org).

Severe bacterial infections are a major cause of morbidity and mortality among newborns and young infants in the developing world. Recent analyses estimate that globally, 717,000 newborns die as a result of severe infections, accounting for nearly one-third of the total burden of newborn deaths,¹ and a significant proportion of stillbirths are due to infectious causes. Most of these deaths could be averted through simple preventive measures, such as improving hygiene and ensuring that curative care is available to sick newborns.

Severe bacterial infections in newborns can result from any number of infectious agents and can be acquired in-utero, during delivery, or after birth. Some infections, such as syphilis, are transmitted from mother to child during pregnancy or delivery. Other infections are the result of environmental causes or behavioral practices (like tetanus) at birth or during the first weeks of life. Sepsis, meningitis, and pneumonia are major causes of newborn morbidity and mortality in developing countries. It can be challenging to differentiate these infections in newborns, so they are often grouped together as a clinical syndrome, referred to as possible serious bacterial infection (PSBI).

**Prevention**

Preventive measures during the antenatal and intrapartum periods can reduce the risk of congenital and newborn infections, while also protecting the health of the mother. In malaria prone areas, the risk of associated complications of pregnancy and childbirth can be much reduced through intermittent presumptive treatment through pregnancy and consistent use of bed nets. Before and during pregnancy, women can be screened and treated for syphilis and vaccinated against diseases like tetanus. In addition to preventing subsequent infection in the newborn, treating maternal infections during pregnancy can also reduce the risk for preterm birth, another leading cause of newborn mortality.²

There is strong evidence that clean birth practices, including hand washing before, during, and after delivery, reduce the rate of newborn infections in home and facility settings.³ Hygienic umbilical cord care also helps prevent infection; this care includes using a sterile instrument to cut the cord as well as applying chlorhexidine to the newborn cord stump soon after cutting (Box 1). Finally, early and exclusive breastfeeding reduces the likelihood of newborn infections in two key

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ways: first, by providing critical support to boost immune system development, and second, by avoiding the introduction of potentially harmful substances (through prelacteal feeds) to the immature gut.

**Identification and Treatment**

Timely identification and treatment of newborn infection is critical. Although most infections develop at home, the current standard of treatment requires in-patient care. Identifying severe infection and initiating appropriate antibiotic treatment early can dramatically increase a newborn’s chance of survival. However, there are significant barriers to early identification and adequate treatment:

| Supply | • Poor access to health facilities due to financial or logistical challenges  
| • Poor quality of care (perceived or real)  
| • Health system challenges (e.g., lack of trained staff, stock-outs of essential supplies) |
| Demand | • Lack of knowledge and recognition of newborn danger signs  
| • Limited or delayed care-seeking outside the home for danger signs  
| • Lack of family acceptance of referral for hospital treatment  
| • Family unwillingness to stay in hospital for the full duration of treatment (10-14 days) |

Strategies to address newborn infections must therefore be multifaceted, incorporating health education and behavior change approaches as well as health system strengthening.

In response to these challenges, a number of projects have developed community-based approaches for identifying and treating severe newborn infections. Projects in India and Bangladesh achieved significant reductions in neonatal mortality using community- and home-based approaches for the identification and management of severe infections in newborns. Case management approaches that entail making care available at more peripheral level show promise in facilitating the identification, referral, and treatment of newborns with infections; however, implementation experience has been somewhat limited to-date.

**Box 2. Simplified Antibiotic Regimens for Newborn Sepsis**

Currently, the standard treatment regimen for severe newborn infections involves a 10-14 day course of injected antibiotics, administered in a hospital setting. This regimen presents significant challenges for families and health systems alike. A series of clinical trials are currently underway to test the effectiveness, acceptability, and feasibility of simplified antibiotic regimens, which rely less exclusively on injected antibiotics. These regimens can be delivered in community or outpatient settings.

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