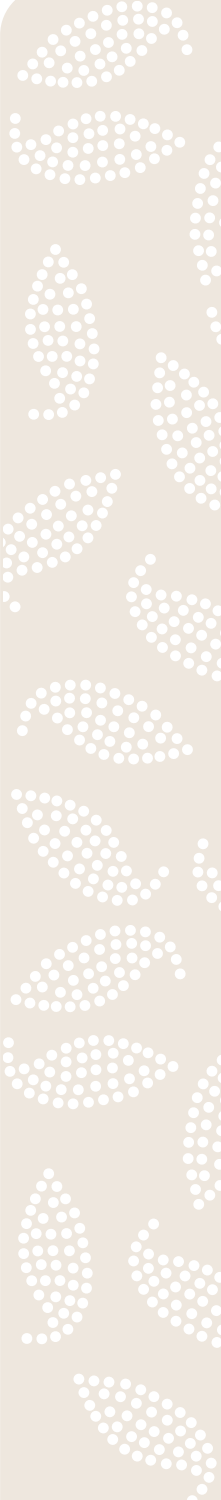


# Using Evidence to Save Newborn Lives

Policy Perspectives on Newborn Health

*By Zulfiqar A. Bhutta, Gary L. Darmstadt, and Elizabeth I. Ransom*



While the overall health of children has improved around the world, the death rate of newborns—babies less than one month old—has hardly changed; in some countries it has even increased. World leaders at the United Nations Millennium Summit in September 2000 agreed to reduce the deaths of children less than 5 years old by two-thirds before 2015. According to child health experts, this goal is unattainable without reducing newborn deaths by at least half, as these deaths now comprise 40 percent of all child deaths.<sup>1</sup> In fact, babies' risk of death during their first month is 15 times higher than during any other month of their first year. Achieving this goal will require greater emphasis on proven, cost-effective measures to save newborn lives.<sup>2</sup>

This brief presents findings from a comprehensive review of evidence on the impact of newborn health interventions in less developed countries and offers compelling support for using research as a tool for identifying the most effective measures for saving newborn lives. The review, supported by the World Health Organization (WHO) and Save the Children's Saving Newborn Lives (SNL) initiative, was designed to provide a solid foundation for the development of policies, programs, and research studies related to newborn health.<sup>3</sup>

## Research's Role in Crafting Sound Health Policies and Programs

Carefully conducted and analyzed research can save lives by helping decisionmakers design effective policies and programs.<sup>4</sup> For research to influence policy, however, it needs to be communicated effectively and used in the decisionmaking process.<sup>5</sup>

Several international initiatives highlight the importance of using research to inform policy. The Better Births Initiative, for example, strives to use research to influence policy decisions about maternal health care. The initiative, which was developed when researchers observed a discrepancy between research evidence and actual practice in labor wards in several countries, “aims to ensure that clinical policies and practices ... are grounded in reliable research.”<sup>6</sup> The Cochrane Collaboration, an international organization that seeks to help people make well-informed health care decisions by “preparing, maintaining and promoting the accessibility of systematic reviews of the effects of health care interventions,” provides an Internet database of these reviews.<sup>7</sup>

WHO has launched a broad initiative on health research systems analysis that will assess how health research is used. WHO provides an online resource on up-to-date research findings about reproductive health care in less developed countries, and plans to focus on how research advances can lead to improved health in its *World Health Report 2004*.<sup>8</sup>

Bilateral donors are also investing in systems and projects to support wide dissemination of population and health data, research results, and best practices. Britain's Department for International Development funds id21, an electronic network that disseminates summaries of new research. The U.S. Agency for International Development supports several organizations, including the Center for Communication Programs at Johns Hopkins University, which disseminates information about effective health care and other practices, and the Population Reference Bureau, which helps policy-level audiences access and use technical information and survey results.<sup>9</sup>

## Box 1

**Promising Areas For Further Research**

This review identified the following areas of research as priorities to advance newborn health and survival.

**Improve Household and Community Practices and Behaviors**

- Develop and evaluate culturally and country-appropriate models for maternal and newborn care (packages of interventions and means of service delivery) and demonstrate their cost effectiveness.
- Develop and evaluate the impact of strategies for postnatal visitation.
- Identify and overcome barriers to evidence-based, essential newborn care practices in the home.
- Identify and overcome barriers to seeking care for maternal and newborn illness.

**Prevent and Improve Care for Low Birth-Weight Infants**

- Prevent low birth weight by improving maternal nutrition and controlling maternal infections.
- Adapt and expand use of kangaroo mother care.
- Improve recognition and appropriate referral of low birth-weight babies in the community.

**Prevent and Improve Management of Birth Asphyxia**

- Develop and evaluate the cost-effectiveness of models of care for preventing and managing birth asphyxia that can be applied on a national scale in resource-poor settings and that link community and referral systems.
- Identify feasible and cost-effective roles for community health workers, first-line health workers, and traditional birth attendants in reducing birth asphyxia.
- Develop valid indicators and methods for collecting data for monitoring the impact of programs on asphyxia-related outcomes (including stillbirths).

**Prevent and Improve Recognition and Management of Newborns' Infections**

- Identify agents of infections in the community.
- Develop more sensitive and specific diagnostic algorithms.
- Develop evidence-based standard treatment strategies.
- Simplify and improve antibiotic delivery.

**What Research Says About How to Save Newborn Lives****Context for Improving Newborn Health and Survival**

Improving newborn health requires incorporating the needs of this vulnerable population into existing health-sector programs. For example, many newborn lives can be saved in primary care settings if health professionals recognize and treat serious infections.<sup>10</sup> These efforts may be especially important—even potentially life-saving—in circumstances where referral may not be possible.

Research also shows that increasing a woman's education and social status improves the health of other household members, including her newborn children.<sup>11</sup> When women are able to space their pregnancies and regulate family size, their children are more likely to survive and live healthy lives.<sup>12</sup> In addition, focusing more attention on the poor will improve newborn health: A recent analysis of Demographic and Health Survey data shows that the poorest population groups have significantly higher newborn death rates than the richest groups.<sup>13</sup>

The health of newborns must be considered with that of their mothers, who also face significant risks during and in the days following delivery.<sup>14</sup> Causes related to pregnancy, delivery, and infections each account for about one-third of newborn deaths, so interventions need to address both mothers and newborns. Though interventions to save mothers' lives were not assessed separately in this review, safe motherhood programs are thought to provide a cost-effective way to improve newborn and maternal health; conversely, programs designed to improve newborn health and survival may also benefit mothers. In particular, the availability of skilled care during childbirth is considered critical to maternal and newborn health and survival.<sup>15</sup> Skilled care refers to the process by which pregnant women and their infants receive adequate care, especially during and immediately after childbirth; it includes, but is not limited to, care for women with life-threatening complications.<sup>16</sup>

**Results of the Intervention Review**

The review assessed interventions to prevent stillbirths and improve newborn health and survival during the period before birth (antenatal), during delivery (intrapartum), and after childbirth (postnatal). Because most newborns who die do so at home during the first week of life without any contact with a health care provider, the review focused on programs in communities with limited access to hospitals or other health care facilities. The review also assessed public health programs and interventions already in place, recommendations from WHO and other expert

institutions and individuals, biological plausibility, and evidence from developed-country studies. The review did not include evaluation of interventions that are currently being assessed, such as certain obstetric interventions and HIV/AIDS prevention and treatment.

The review classified interventions into the following categories: “evidence of no or negative impact,” “uncertain evidence [of positive impact],” “some evidence [of positive impact],” and “clear evidence [of positive impact].” This brief focuses primarily on interventions justified by “clear evidence.” Interventions for which there is negative, no, or uncertain evidence have not yet been proven conclusively to improve newborn health and survival. The Saving Newborn Lives initiative plans to conduct research and intervention trials to test promising areas of newborn health care not discussed in this brief (see Box 1).<sup>17</sup>

The review recommended key behaviors and interventions that health programs should include to improve newborn survival (see Figure 1). In general, the findings confirmed commonly held expert opinion.<sup>18</sup>

The following principal elements of successful interventions for saving newborn lives at the community level emerged from this review: providing essential care to mothers during pregnancy, providing care for mothers and infants during labor and delivery, and providing postnatal care.

### ***Provide Essential Care to Mothers During Pregnancy***

The antenatal care a woman receives can have a strong influence on her newborn’s health and potential for survival. Traditionally, antenatal care required pregnant women to make multiple visits to health care providers and receive a wide variety of services. In recent years, research has shown that a narrower range of services during fewer visits can also improve maternal and newborn health.<sup>19</sup> This review found that antenatal care programs could have a positive impact on newborn health if they included the following measures:

■ **Immunize mothers against tetanus.** Research shows that the most effective programs to combat neonatal tetanus provided mothers with tetanus toxoid immunizations and clean delivery care.<sup>20</sup> Because a newborn can get tetanus if the umbilical cord is cut with unclean instruments, treated with unhygienic applications such as cow dung, or otherwise exposed to bacteria in the environment, antiseptic cord-cutting and care practices pro-

vide essential protection to newborns. Neonatal tetanus causes an estimated 7 percent of global newborn deaths per year. Pregnant women can receive tetanus toxoid immunizations as part of antenatal care packages or through mass vaccination programs that can be designed to reach all women of reproductive age.

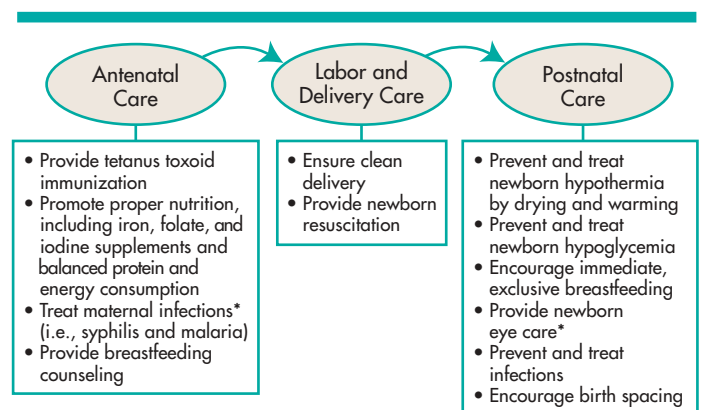
■ **Give supplemental iron and folic acid to women of childbearing age.** Research shows that providing women with folate supplements before and around conception can reduce the occurrence of neural tube defects in newborns. Preventing iron deficiency anemia, which affects almost half of women in less developed countries, can improve newborns’ health and likelihood of survival. When mothers suffer from severe anemia, their newborns are more likely to have low birth weight, be born too early, be born dead, or die shortly after birth. The newborns who survive are at risk of cognitive impairments. Iron and folate supplements are especially important in areas where malaria is common.

■ **Promote the intake of adequate amounts of iodine among pregnant women.** Iodine supplements can improve survival and prevent damage to newborns’ cognitive development.

■ **Promote consumption of balanced amounts of energy and protein.** Ensuring that mothers receive adequate nutrition is particularly important in areas where many women suffer from malnutrition. In some settings, consumption of balanced amounts of protein and energy during pregnancy has been shown to increase birth weight and reduce stillbirths and newborn deaths.

Figure 1

### **Evidence-Based Essential Newborn Care**



\*These interventions depend on the context of the newborn care program.

SOURCE: Z. Bhutta et al., *Community-Based Interventions for Improving Perinatal and Neonatal Outcomes in Developing Countries: Review of the Evidence* (forthcoming).

■ **Educate women about the importance of immediate and exclusive breastfeeding.**

Immediate breastfeeding can decrease the risk of maternal hemorrhage and newborn hypoglycemia (low blood sugar), and exclusive breastfeeding has a wide variety of proven health benefits for newborns, including improved cognitive development, reduced risk of infections, and better chances of survival.

■ **Provide antimalarial drugs and use insecticide-treated bed nets in areas where malaria is endemic.** These interventions can reduce the risk for maternal anemia and placental infection and thus prevent low birth weight and improve newborn survival.

■ **Provide screening and treatment in areas where syphilis is endemic.** Untreated syphilis can cause malformation, illness, or death of a fetus or newborn.

***Provide Care During Labor and Delivery***

While skilled care at delivery has long been associated with improved maternal and newborn survival, there has been little evaluation of the impact that training traditional birth attendants (TBAs) or community health workers (CHWs) has on newborn health. The review suggests that further definition of the roles of these workers and their impact on newborn health should be explored. Further research is needed to define which specific interventions TBAs and CHWs can most effectively be trained to provide, delineate criteria for selecting workers to be trained, develop appropriate pre- and in-service training programs, and evaluate the interventions' cost effectiveness (see Box 1).

The review identified two priority interventions during labor and delivery: reducing the risk of infection to mothers and newborns by keeping the birth attendant's hands and all contact with the newborn's umbilical cord (especially cutting instruments and ties) clean, and resuscitating newborns who are not breathing normally after birth. Having a skilled birth attendant present can save lives. When a newborn does not cry or breathe despite the stimulation provided by vigorous drying, the skilled

*Box 2*

**Testing a Community-Based Intervention to Save Newborn Lives in Sylhet, Bangladesh**

Researchers, program managers, and policymakers have teamed up in Bangladesh to design, deliver, and evaluate the impact of an approach to saving newborn lives in a rural district. The team based the design of the approach on the following:

- Review of the research about the impact of newborn health care interventions locally and globally;
- Discussions with Bangladeshi and international health care leaders regarding priorities for improving national newborn health and survival;
- Experience with delivering newborn health services;
- Formative research on current attitudes, beliefs, and practices in newborn care;
- Research about the acceptability of the proposed evidence-based practices;
- The feasibility of implementing the interventions on a wide scale; and
- The ability to inform current health systems about effective approaches to delivering newborn care.

The following measures were included in the package:

- Antenatal care, including tetanus toxoid immunization and iron-folate supplements;
- Birth preparedness training;
- Clean delivery;
- Resuscitation of asphyxiated newborns;
- Newborn thermal protection;
- Exclusive breastfeeding;
- Clean cord care;
- Recognition of maternal and newborn danger signs and timely care-seeking;
- Early postnatal contact with a health provider; and
- Case management of serious bacterial infections.

The team's approach was based on locally endorsed measures and on current research and experience. The interventions were designed to provide the Ministry of Health and Family Welfare a feasible and affordable way to improve newborn health and survival throughout Bangladesh by early 2005.

birth attendant should be prepared to provide artificial respiration.

***Provide Postnatal Care***

Mothers and newborns are especially vulnerable during the period immediately following delivery. Over 60 percent of maternal deaths occur during the first six weeks after birth, and nearly half of those deaths take place during the first day after delivery.<sup>21</sup> Research shows that two-thirds of neonatal deaths occur in the first week of life; two-thirds of those deaths occur within the first 24 hours. Certain actions can help make this period safer for newborns:



## Box 3

**Using Evidence to Design a Home-Based Approach to Newborn Health Care in Gadchiroli, India**

In India's Gadchiroli district, the Society for Education, Action and Research in Community Health (SEARCH) used evidence about effective newborn care to develop a home-based approach to benefit newborns and their mothers. More than 80 percent of births in rural India occur at home and far from health facilities. After two years of study, SEARCH introduced neonatal care through trained village health workers and trained birth attendants. The approach involved the following:

- Educating new mothers about health;
- Providing immediate care to newborns, including resuscitating newborns who are not breathing regularly after birth;
- Supporting breastfeeding and maintenance of infant body temperature;
- Providing increased vigilance for problems in preterm and low birth-weight infants;
- Recognizing danger signs that suggest serious newborn infections and treating them with antibiotics; and
- Giving village health workers the ability to dispense antibiotics in family homes—previously the exclusive domain of doctors in health care facilities.

By the program's third year, newborn mortality had fallen by 60 percent in the study areas and there was a significant reduction in various newborn and maternal illnesses. The findings of the Gadchiroli trial are important given the challenge of providing care for remote populations. Such community-based newborn care approaches are being evaluated in programmatic and health system settings in Africa and south Asia, with additional elements of improved care-seeking practices and referral systems.

■ **Prevent and manage hypothermia** (low body temperature) by drying and wrapping the entire baby (including the head) right after delivery, breastfeeding immediately, delaying the baby's first bath, providing close contact with the mother, and keeping the room warm and the baby properly clothed or wrapped. "Kangaroo mother care," which involves constant skin-to-skin contact between mother and newborn, may provide a highly cost-effective way to prevent hypothermia, especially for low birth-weight infants.

■ **Encourage mothers to breastfeed** and give them counseling about how to do so. By breastfeeding immediately and exclusively, mothers can protect their newborns from a wide variety of risks, including hypothermia, hypoglycemia, and infections. Infants who are breastfed also have improved chances for survival.

■ **Prevent and manage infections** through clean cord care and timely recognition and antibiotic treatment of life-threatening infections such as pneumonia, sepsis, and meningitis.

■ **Prevent eye infections in newborns** by providing topical antibiotic treatment in areas where sexually transmitted infections—particularly gonorrhea—are endemic.

■ **Encourage birth spacing.** Women who have babies at intervals of less than 36 months have significantly increased risk of delivering low birth-weight, premature babies and of having a newborn die. Family planning programs can increase women's knowledge about and access to contraceptive methods that will help them space their births.

**Conclusion**

This brief presents the essential elements of newborn care that are known to be effective. The challenge facing health policymakers is putting these recommendations into action.

SNL is testing integrated approaches to improving newborn care, by applying interventions selected on the basis of the evidence presented in the review. SNL is evaluating packages of antenatal, intrapartum, and postnatal interventions in several countries, including Bangladesh, India, Malawi, and Pakistan. The initiative is adapting each package to local needs and models of service delivery (see Box 2, page 4). In India, for example, a home-based approach to care has resulted in a dramatic reduction in newborn deaths (see Box 3).

Since two-thirds of newborn deaths occur in the first week of life, early postnatal care for mothers and newborns is essential. Addressing newborn health issues by integrating interventions more effectively into safe motherhood programs may provide a cost-effective way to improve newborn and maternal health. But these efforts cover only the first few days of life, so it is important to ensure that child health programs also address newborns' health needs. Newborn health can also be improved by integrating the needs of newborns into other programs, such as primary care services, emergency transportation

to higher levels of care, and regular systems to monitor progress. In addition, carefully designed research geared toward improving the delivery of known interventions and testing new approaches to improving newborn health will save more of these vulnerable members of society.

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