Home and Community-Based Health Care for Mothers and Newborns

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ACKNOWLEDGMENTS

AUTHORS:

Suellen Miller
Sandra Tebben Buffington
Diana Beck
Joseph de Graft-Johnson
Patricia Daly
Susan Otchere
Kathryn E. McNatt
Janet Molsan Turan
Erin H. Bray

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CONTRIBUTING EDITOR:
Jill Gay

GRAPHIC DESIGNER:
Jamie Wolfe

EDITORIAL ASSISTANCE:
Katrin DeCamp
Juliet MacDowell

PRODUCTION ASSISTANCE:
Youngae Kim
Deborah Raynor

HOME-BASED MOTHER AND NEWBORN CARE WORKING GROUP:

The ACCESS partnership would like to thank members of the Home-Based Mother and Newborn Care Working Group for their initial guidance and assistance in reviewing draft manuscripts, and for making recommendations that have strengthened this guide. These members include:

Diana Beck (American College of Nurse-Midwives)
Sandy Buffington (American College of Nurse-Midwives)
Patricia Daly (Save the Children USA)
Patricia Gomez (JHPIEGO)
Joseph de Graft-Johnson (Save the Children USA)
Indira Narayanan (BASICS)
Susan Otchere (Save the Children USA)
Harshad Sanghvi (JHPIEGO)
Steve Wall (Save the Children USA)

EXTERNAL REVIEWERS:

Many persons with extensive experience in maternal and neonatal health and in working with communities have reviewed this guide. ACCESS is thankful to the following for their valuable suggestions and encouragement:

Sarla Chand
Gary Darmstadt
Frances Ganges
Robert Johnson
Lily Kak
Marge Koblinsky
Nahed Matta
Petra Reyes
Nancy Russell
Theresa Shaver
Lynn Sibley
Judith Standley
Mary Ellen Stanton

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ABBREVIATIONS AND ACRONYMS

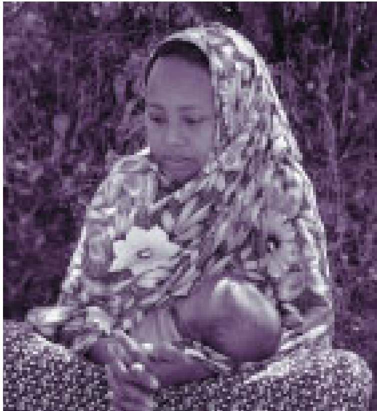
ANC	Antenatal care
CHW	Community health worker
HBLSS	Home Based Life Saving Skills
HHCC	Household-to-hospital continuum of care
IM	Intramuscular
ITN	Insecticide-treated bed net
IV	Intravenous
KMC	Kangaroo Mother Care
MIRA	Mother Infant Research Activities
NASG	Non-pneumatic anti-shock garment
PMTCT	Prevention of mother-to-child transmission [of HIV]
PROJAHNMO	Project for Advancing the Health of Newborns and Mothers
SEARCH	Society for Education, Action, Research in Community Health
TBA	Traditional birth attendant
VCT	Voluntary counseling and testing [for HIV]

EXECUTIVE SUMMARY

Every year more than 500,000 women die from complications related to pregnancy and birth, and over 4 million infants die within the first 28 days. Ninety-nine percent of these deaths occur in developing countries.[1] Maternal and infant health are so closely linked that the delivery of effective interventions to improve maternal health can also avert 70% of newborn deaths.[2]

The Millennium Development Goals to be achieved by 2015 have focused global health efforts on maternal and newborn health: Goal 4 is to reduce the death rate for children under age 5 by 67% and Goal 5 is to reduce the maternal mortality ratio by 75%, from 1990 levels. These goals can be achieved only through interventions linking the household, community, and facility levels.

ETHIOPIA: Young mother



American College of Nurse-Midwives/ Sandra Buffington

Recent efforts to improve maternal health have focused on skilled attendants and emergency care at health facilities. Skilled birth attendants and access to emergency obstetric care are essential to saving mothers lives.[3] In developing countries, 60 million women give birth at home without skilled care and with high maternal and neonatal mortality. Nearly all essential newborn care can be provided safely, effectively, and at a low cost at the household level.[4] The same is true for care of the mother, and many effective interventions can be implemented at the household and community level that will save mothers' lives. However, some interventions can be implemented only by skilled attendants and in well-equipped facilities.

This document summarizes activities that save the lives of mothers and infants in the household and community. Information is provided on evidence-based practices and practice-based evidence to date, as well as how these can be implemented into an overall program. It is written for individuals and agencies that plan and manage maternal and infant health programs.

The pathway-to-survival concept guides the focus of interventions at the household, community, and health facility levels. Interventions for women and newborns are highlighted in boxes throughout the document. No single intervention should be implemented from one place to another without being modified to suit the particular situation, needs, and resources of the communities served.

The interventions presented in this document cover the household-to-hospital continuum of care and comprehensively address social, health, and operational issues at all levels. They include:

Linking households, communities, and facilities | Some obstetric and neonatal complications cannot be prevented. Women and their infants must receive lifesaving care as soon as the complication happens, during referral, and at appropriately equipped health facilities. These linkages must be established and then maintained, evaluated, and redesigned over time and as the situation changes.

NEPAL: Community members attend a newborn health meeting

Save the Children/Thomas Kelly

Community participation, mobilization, and behavior change | Community mobilization is an effective means to behavior change around care seeking,[5] strengthening the household-to-hospital care continuum. Community members assess their own health needs and develop and monitor their own solutions to identified problems. This has been shown to be effective in improving the utilization of emergency services for mothers and infants.

Household and community level care |

■ *Preconception:* Effective interventions to reduce maternal and newborn mortality need to start before a woman becomes pregnant. To prepare for a healthy pregnancy and newborn, young girls and women need a diet that builds a strong body before they become pregnant. They also need interventions, such as tetanus toxoid during primary school, folic acid supplements before conception, and safe sex counseling with messages about preventing sexually transmitted infections. Delaying marriage and first pregnancy, and spacing children at least 3 years apart are policy, social, and cultural issues that succeed only when implemented in the context of the home and community. The connection between maternal education level and neonatal survival is well-documented; therefore, an important policy decision to save the lives of mothers and newborns is to raise the grade level of compulsory education for girls.

■ *Antenatal:* Community-based programs can help ensure that all pregnant women receive basic antenatal care (ANC) interventions: tetanus toxoid immunization; promotion of proper nutrition; iron and folate supplementation; prevention, detection, and treatment of maternal infections including malaria, HIV, and syphilis; breastfeeding counseling; and blood pressure checks for early detection of pre-eclampsia/eclampsia.[6]

These interventions can be delivered through outreach, home visits, or mobilizing women to come to ANC. Community members, women, and caregivers can prepare for emergencies and learn to recognize danger signs during pregnancy, birth, and the postpartum period, and respond appropriately.

- *Birth and immediate postpartum:* Labor, delivery, and immediate postpartum are the most dangerous periods for both mothers and infants, and most maternal deaths occur during this period. However, there are lifesaving interventions that can be implemented at home by the home birth attendant (a family member, traditional birth attendant, community health worker, or a skilled attendant). Lives can be saved by overcoming delays through: immediate recognition of danger signs; knowledge and skills of emergency first aid; understanding where to go for emergency obstetrical care; and stabilization during referral.

- *Late postpartum and neonatal:* Home care is essential because of the high proportion of newborns who die in the first month of life, and the fact that all women, regardless of where they deliver, will be at home for the majority of their postpartum period. The later postpartum period extends from 6 hours to 6 weeks after birth. For mothers and infants who do not respond to community-based treatments, a referral system must be in place.

INDONESIA: Pregnant woman receives antenatal care

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Optimum maternal and infant care can be delivered only through a continuum of household-to-hospital interventions. Successful community mobilization projects involve communities that diagnose their own problems and suggest appropriate solutions. The results of a community needs assessment may indicate gaps between evidence-based practices, practice-based evidence, and reality. Stakeholders, guided by what is feasible financially and politically, can prioritize problems and begin a process of identifying solutions.

It is every woman's and newborn's right to have a safe pregnancy and safe delivery. Home and community-based interventions are effective in contributing to achieving the goals of saving maternal and neonatal lives. Vital stakeholders—those with an interest in saving the lives of women and infants and armed with the information about interventions that are effective at the household and community level—can collaborate with community members, health care providers, and program planners. Together, they can discover where maternal and neonatal deaths occur, prioritize their health systems' needs, implement proven interventions, and monitor and evaluate their progress toward saving the lives of women and infants, thereby working toward Millennium Development Goals 4 and 5.

INTRODUCTION

This document summarizes activities and interventions designed to save the lives of mothers and infants in the household and community. To significantly save lives, **interventions must be available where and when they are most needed**—whether this is in the home, community, or referral facility. This document:

- Provides information on evidence-based and best practice strategies, interventions, and programs that decrease maternal and infant mortality;
- Stresses the crucial links between households, communities, and health facilities; and
- Focuses on interventions and practices to prevent complications, provide emergency care, and reduce delays at the household and community level.

Evidence

As an outline and reference for preparing this document, a table was prepared entitled “Home and Community Maternal-Newborn Interventions and Benefits for: Woman, family, birth attendant, community members, or skilled attendant.” Consensus was reached for interventions discussed in this document. Literature was reviewed and it was decided whether the intervention was **evidence-based practice (ranging from promising to clear evidence)** or **practice-based evidence (sometimes called best practice)**, noting that the intervention achieved its aim or was successful in increasing knowledge, health, and/or appropriate utilization of services.

Research strategy

The review was conducted using several databases,[7] websites,[8] personal communications,[9] and publications. Facility-based interventions, education of medical practitioners (pre-service or in-service), and the extensive debate over traditional birth attendant (TBA) training were excluded. Results are summarized and intervention examples provided in narrative and table form. This document provides the reader with an introduction to pertinent information about the home and community-based interventions used for both maternal and neonatal populations, as well as an extensive reference list and websites for further investigation. Continued research of home and community-based strategies and interventions is needed to explore the positive outcomes, as well as scalability and sustainability.

FOCUSING ON THE HOUSEHOLD AND COMMUNITY

Women who experience labor and delivery with skilled attendants are at lower risk of death and illness than the approximately 60% of women worldwide who experience labor and delivery alone, with a family member, a TBA, community health worker (CHW), or other unskilled attendants (Box 1: The Problem).

BOX 1 | The Problem

WOMEN[10]

- 211,000,000 pregnant women every year
- 529,000 die every year due to pregnancy
  - 24% during pregnancy
  - 15% in childbirth
  - 61% after baby is born[11]
- Over 99% who die are in developing countries

BABIES[12]

- 130 million born every year
- 8 million die every year within the first month
  - 50% are stillborn
    - 34% of stillborns occur during delivery
  - 50% die in first 4 weeks of life (neonatal deaths)
    - 75% of neonatal deaths occur in the first week of life (early neonatal deaths)
- About 99% who die are in developing countries

Skilled birth attendants and access to emergency obstetric care are essential to saving the lives of mothers.[13] However, even with rapid scale-up, it will take time and money to train adequate numbers of skilled attendants to be available for each birth.[14] While focusing on emergency obstetrical and neonatal care, new programs should address critical obstacles to accessing services such as lack of money, inadequate transport, limited communications, lack of community awareness and mobilization, non-functioning referral systems, and other key barriers.[15] These interventions must be initiated at the household and community level.

The health of mothers and infants is closely linked (Table 1: Potential Outcome if No Interventions). The delivery of effective interventions to improve maternal health is estimated to prevent 70% of newborn deaths;[16] when a mother dies, the newborn is ten times more likely to die.[17] In low-resource settings with high maternal and neonatal mortality and weak health systems, home and community-based interventions are essential to save the lives of both mothers and their infants.[18]

Even in countries and areas where access to skilled attendants and emergency care is adequate, there is still a need for home and community care interventions. Factors contributing to maternal deaths include the five delays listed in Figure 1: Pathway to Survival. Not only do these delays often originate at the household and community level, but so do the solutions. For example, unless the woman, her family, and/or her community know the danger signs that require skilled attendant care, the woman and her infant may die. Although numbered one through five, the steps of the delays and solutions may happen simultaneously or in any order. Family and community members must be prepared for complications and be skilled in emergency first aid at home before and during transport to skilled attendant care.

Everyone from the family to the government must be committed to finding solutions for prevention of maternal and infant death, including birth

TABLE 1 | Potential Outcome if No Interventions

MATERNAL OUTCOME	MATERNAL CONDITION	PERINATAL/NEWBORN OUTCOME
	DURING PREGNANCY	
Anemia	**Folic Acid Deficiency**	Stillbirths, neural tube defects
HIV/AIDS, death	**HIV/AIDS**	HIV infection
Anemia, death	**Malaria**	Prematurity, intrauterine growth retardation, stillbirth
Convulsions; kidney, brain, lung, and heart problems; death	**Pre-Eclampsia/Eclampsia**	Stillbirth, asphyxia
Unsafe abortion, infection, hemorrhage, infertility	**Unwanted Pregnancy**	Increased risk of morbidity from abuse, neglect
	DURING LABOR	
Sepsis, death	**Unclean Delivery: Environment**	Sepsis, death
	Unclean Delivery: Cord Care	Tetanus, sepsis, death
	Premature Rupture of Membranes	Sepsis
Prolonged/obstructed labor, lacerations, fistula, cesarean section, death	**Malpresentation**	Meconium, asphyxia, birth traumas
Convulsions; kidney, brain, lung, and heart problems; death	**Pre-Eclampsia/Eclampsia**	Stillbirth, asphyxia
	DURING POSTPARTUM	
Engorged breasts	**No Colostrum Feed**	Delayed suck reflex, nutrient loss, potential hypothermia
Postpartum hemorrhage, death	**Retained Placenta/ Uterine Atony/ Lacerations**	Nutrient loss, sepsis, death
Convulsions; kidney, brain, lung, and heart problems; death	**Pre-Eclampsia/Eclampsia**	
Sepsis, death	**Infection**	

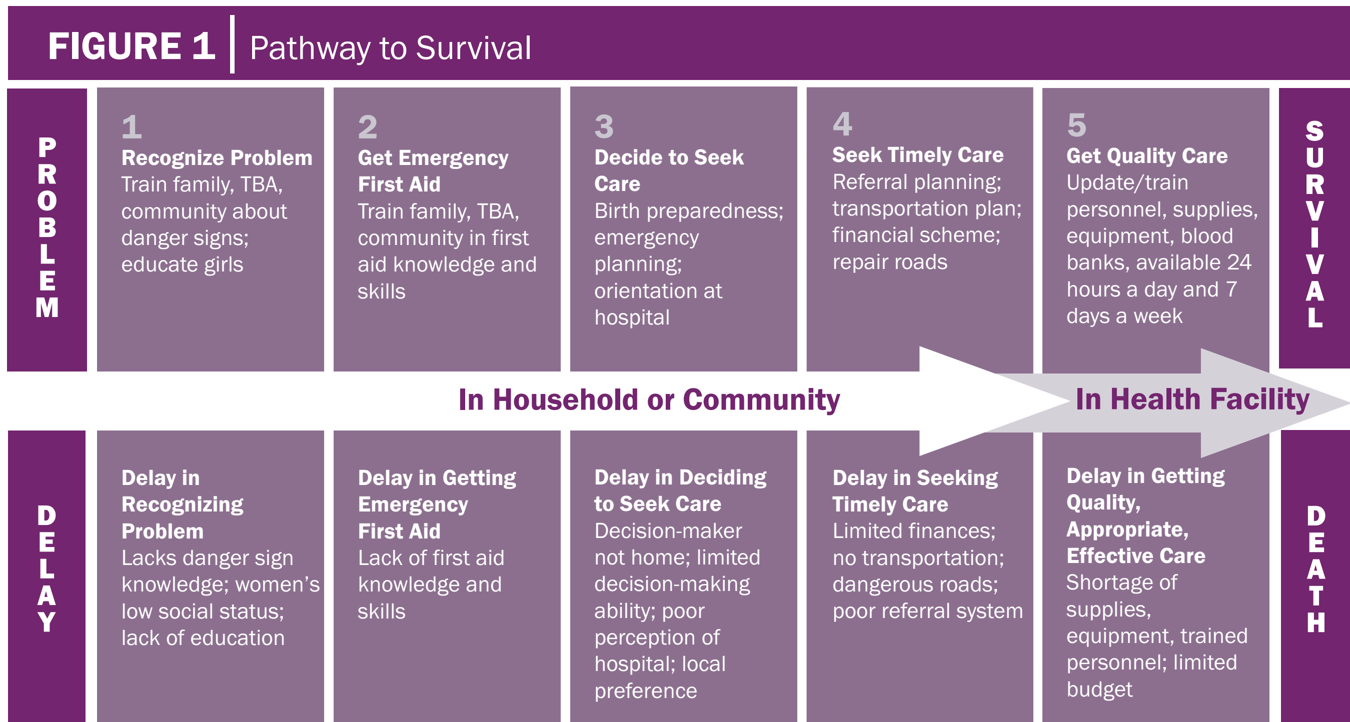
Source: The Healthy Newborn—A Reference for Program Managers. Lawn, et al[19]; adapted Miller 2005; modified ACCESS 2006.

preparation and complication readiness at all levels. Long-term solutions—such as identifying strategies for providing affordable education for girls, emergency transportation, first aid training, and skilled attendant care—will require working together across all levels and sectors of civil society and government.

The household-to-hospital continuum, which ensures the provision of care at all levels (household, community, peripheral facility, hospital) as well as the critical linkages between these levels, is necessary to prevent both maternal and neonatal deaths.[20] In the household-to-hospital continuum of care (HHCC) model, caregivers at the household and/or community level are capable of providing basic maternal and newborn care, and making decisions to refer for care at the next level in the face of danger signs. As shown in Figure 2: Household-to-Hospital Continuum of Care, the peripheral health facility serves as the link between the household and hospital.

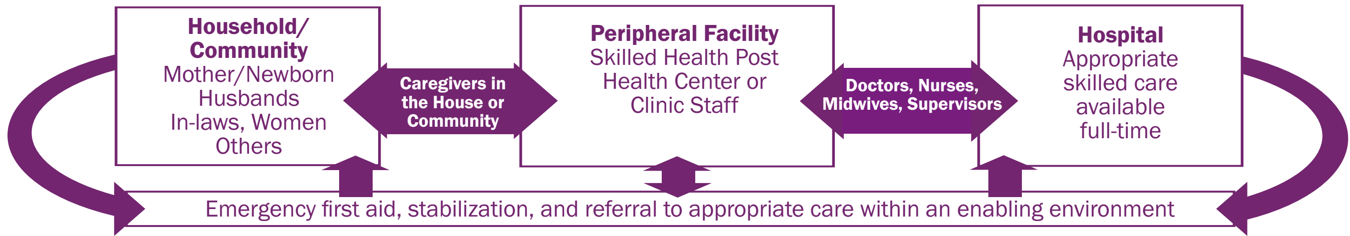
Policymakers and program managers must find ways to implement household, community, and facility-based interventions as a package within the HHCC. Many recent efforts have focused on facility-based interventions[21] reaching out to the home.

FIGURE 1 | Pathway to Survival



Source: MotherCare Matters, 1996 Volume 5 No. 4, ACNM adapted 2000 and modified 2005.

FIGURE 2 | Household-to-Hospital Continuum of Care



Adapted from: de Graft-Johnson et al. (2005). Household-to-hospital continuum of maternal and newborn care. ACCESS.

CRITICAL ELEMENTS: LINKAGES AND COMMUNITY MOBILIZATION

Linking households, communities, and health facilities

Mothers and infants need round-the-clock access to emergency first aid care. One important way to enhance access to emergency obstetrical care is to establish emergency first aid care readiness at home linking households, communities, and facilities. The links depend on immediate access to funds for emergency care and transport. The funds may be personally planned for, privately funded, subsidized, or provided free of charge. In one example, China reduced its maternal mortality over a 30-year period from 1,500 per 100,000 live births to 61 per 100,000 live births by linking birth attendants to a functional referral network that reached into communities, an effort complemented by social campaigns.[22] Functional referral network elements and details of these elements are explained below:

Birth preparedness | During pregnancy, women and their families should prepare for normal labor, birth, and postpartum for mother and infant, as well as for complications that could arise. A project for birth preparation in Senegal (Box 2: Newborn Health Interventions in Senegal) resulted in statistically significant improvements in immediate and exclusive breastfeeding, as well as optimal cord care and temperature maintenance for newborns.[24] Other studies show that appropriate referral of women with complications was increased by families and providers who were taught physical signs of pre-eclampsia and hemorrhage through photographs.[25]

BOX 2 | Newborn Health Interventions in Senegal[23]

What Is It?	■ A program to train/build capacity, at population level, in essential newborn care ■ Aim: Reduce perinatal and neonatal mortality

Main Components	■ Taught skilled health care providers, matrons (women selected from the community), and community health volunteers:
	  ■ ANC of four focused visits, diet, iodized salt, tetanus toxoid, iron/folate, malaria prevention, birth preparedness
	  ■ Preventive care up to 6 hours after delivery
	  ■ Follow-up postnatal care of women and newborns in the first week and follow-up as needed
	■ Conducted social mobilization at the facility and community level, including radio broadcasts, cinebus transmissions, and videos

Where Tested?	■ Kebemer District in the Louga Region, Senegal (2002–2004) ■ Behavioral process indicators used as outcomes (short study duration precluded measuring neonatal mortality rate); household surveys
Main Results	■ Statistically significant improvements were seen for critical essential newborn care practices: birth preparedness, temperature maintenance, cord care, immediate and exclusive breastfeeding, recognition of danger signs ■ Effective communication between health providers in facilities and community groups improved hygiene and maintenance of cleaning supplies ■ Home deliveries decreased from 47% in July 2003 to 25% in July 2004 ■ Community-based deliveries by trained matrons increased from 29% in 2003 to 39% in 2004

- *Preparations:* These include antenatal care (ANC), preparing helpers, and obtaining supplies needed for the birth, complication readiness, and postpartum care to ensure protection of the mother and infant.
- *Transportation plan:* Pregnant women and their families need to make a transportation plan for emergencies. Community members in Nepal (Box 3: Mother Infant Research Activities [MIRA] in Nepal) identified the need for stretchers to transport women more easily. Stretchers were purchased or built, resulting in a significant decrease in neonatal and maternal mortality.[27] Other studies have shown that using a transport plan to link hospitals and primary care resulted in the case fatality rate decreasing from 20% to 10%.[28]
- *Immediately accessible emergency funds:* It is essential that women and families have immediate access to funds for emergency care and transport, or that these costs are subsidized or provided free of charge. This reduces delays in seeking care when an obstetric or neonatal complication is recognized. Availability of funds for emergency obstetrical care, provided as loans, increased service utilization in Nigeria.[29] However, evaluation of the program showed that repayments were not always completed.[30]

Emergency first aid at the household level | Giving emergency first aid care promptly at the home and during transport to the referral facility saves lives. Some examples of emergency first aid by family or community health workers (CHWs) are outlined in Box 4: Examples of Emergency First Aid at the Household Level. Projects for emergency first aid in India and Ethiopia (Box 5: Home Based Life Saving Skills [HBLSS] in India and Ethiopia) demonstrated improvements in increased access to emergency care for poor, underserved, rural populations, as well as home management

BOX 3	Mother Infant Research Activities (MIRA) in Nepal[26]
What Is It?	■ A participatory training of literate local community women as facilitators in rural settings ■ Aim: Decrease perinatal, neonatal, and maternal mortality rates

Main Components	■ Taught facilitators:
	  ■ Skills in using the Warmi Project Community Action Cycle (see Warmi Project, Box 6) to mobilize and educate communities
	■ Taught women's groups:
	  ■ Why mothers and newborns die
	  ■ Danger signs, preparedness, and prevention
	■ Held meetings involving other community members to discuss:
	  ■ Women's groups activities
	  ■ Priority problems identified by the groups
	  ■ Possible strategies
	  ■ Reaching consensus
	■ Women's groups developed and distributed: educational picture card games; clean delivery kits; home visits; stretcher schemes; emergency transportation fund

Where Tested?	■ Makwanpur district, Nepal (2001–2003) ■ Behavioral process indicators used as outcomes (short study duration precluded measuring neonatal mortality rate); household surveys

Main Results	■ Birth outcomes of 28,931 women were monitored in the communities that received the intervention. The results show:
	  ■ Significant 30% decrease in neonatal mortality
	  ■ Significant decrease in maternal mortality
	  ■ More likely to receive prenatal care
	  ■ More likely to deliver in a health care facility or with a trained birth attendant
	  ■ More likely to engage in hygienic home care

BOX 4 | Examples of Emergency First Aid at the Household Level

PREVENTING POSTPARTUM HEMORRHAGE

- Urinate/squat to deliver placenta
- Compression at bleeding site
- Shock care: position, warmth, fluids
- Oxytocics/uterotonics
- Non-pneumatic anti-shock garment

HELPING INFANT BREATHE

- Dry and warm infant
- Wipe mouth and nose
- Stimulate
- Position
- Mouth-to-mouth

of normal maternal and newborn postpartum care and postpartum hemorrhage.[32]

Organized referral and counter referral system | A partnership between those accompanying a woman and her infant to a facility and those receiving the referral is critical to a functioning referral system. Feedback from the referral site staff to the family and community care givers increases opportunities for continued health care.

Supervision and support | There are many models and components of supervision and support activities dependent on the needs of the provider, community, and family. Below are areas to consider:

■ *Clinical skills and knowledge support:* The maintenance and/or improvement of clinical skills and knowledge in individuals who have been trained are critical components to quality assurance and program sustainability. It is important that supportive supervision linkages occur at all health system levels. Families, CHWs, village health committees, skilled attendants, and health care providers in facilities all need support to maintain their knowledge, skills, and motivation. How this is accomplished and the tools used to support this activity will vary according to the country context. However, managers, policy makers, and supervisors have a key role to play in creating a system and atmosphere that supports the adoption of newly acquired skills and ensures the sustainability of improvements in the quality of care.[33] For example, the trainer and/or supervisor could meet monthly to review CHW case management of reported complications.

BOX 5 | Home Based Life Saving Skills (HBLSS) in India and Ethiopia[31]

What Is It?	■ A family focused program for use in settings where home birth is common ■ Aim: Reduce maternal and neonatal morbidity and mortality

Main Components	■ Taught women, families, care givers, and community members:
	  ■ Preventive care for women and newborns including HIV/AIDS
	  ■ Emergency first aid home care that is safe, evidence-based, culturally acceptable, clinically feasible
	  ■ Stabilization and referral
	■ Used pictorial cards for:
	  ■ Birth preparedness, referral decision-making, health seeking, family planning
	  ■ Problem recognition and first aid care for complications (for woman: hemorrhage, infection, prolonged/obstructed labor, eclampsia; for baby: trouble breathing, premature/small for gestational age, infection)
	■ Incorporated community mobilization activities to support behavior changes

Where Tested?	■ Maitha Block, Uttar Pradesh, Kanpur Dehat, India (2000–2002) ■ Liben Woreda, Oromiya Region, Borana Zone, Ethiopia (2000–2004) ■ Monitoring and evaluation focus on four indicators: coverage, performance, case management, and community support

Main Results	■ India Field-Test
	  ■ All 28 villages formed health committees; 75% had monthly meetings
	  ■ Of 239 women surveyed on birth preparedness, over 76%:
	    – Saved money
	    – Identified a referral facility
	    – Made transport arrangements
	  ■ Breastfeeding within one hour of birth:
	    – Baseline: 1.7% of 540 women
	    – 3 years later: 76.2% of 563 women
	  ■ Use of modern method of family planning:
	    – Baseline: 13.5% of 72 women
	    – 3 years later: 61.4% of 545 live births
	  ■ Take action picture cards are an essential component of HBLSS strategy
	■ Ethiopia Field-Test
	  ■ Performance: demonstrated successful transfer of PPH knowledge/skills from trainers to guides (CHW) and were retained by the guides at a level of 70% on average after 1 year
	  ■ Case Management: appropriate for PPH following introduction of HBLSS
	  ■ Community Support: all community health committees in three sentinel sites:
	    – Supported HBLSS program: monthly meetings, pregnancy reporting
	    – Integrated HBLSS into existing child survival program
	  ■ Coverage: Women exposed to HBLSS doubled from February 2003 to December 2004
	  ■ Other Results:
	    – Demonstrated increased access to basic care for poor, underserved, rural populations
	    – Presented first steps to the process of building capacity for a responsive emergency obstetric care system

- *Documentation:* Offering community groups training in documentation and reviewing of pregnancy, birth, and newborn outcomes allows health information to be available for government planning and documentation, as well as for the community. Picture logbooks have been maintained by community groups in Ethiopia with recorded information provided to the closest referral site and reported on the government's monthly report. The community groups then review and discuss the information for their learning and planning purposes.[34]

- *Compensation and supplies:* Support must also come in tangible forms through the provision of needed supplies, transportation reimbursement, and payment in money or in-kind for services provided. An example of compensation to CHWs who are not paid by the public health system includes CHW associations pooling funds to begin micro-credit associations.[35] In India, community health groups collected grain from community members and sold it to raise funds to pay CHWs' salaries.[36] Communities, health systems, and/or projects can provide equipment and supplies through the provision of birthing kits or the basic supplies necessary for a clean delivery—such as clean cloth, water, clothes for mother and infant, soap, food, and water.[37]

Community participation, mobilization, and behavior change activities

Community mobilization supports community members to assess their own health needs and develop and monitor their solutions to identified problems. This has been shown to be highly effective in improving utilization of emergency maternal and newborn care services. A gender-sensitive community project based in Bolivia (Box 6: The Warmi Project in Bolivia) identified and prioritized problems, with planning and implementation of family and community education in safe birth, and resulted in a significant perinatal mortality decrease during a 3-year period. In addition, the project significantly increased the number of women who accessed prenatal care and who breastfed their infants on the first day of life.[39] Similar participatory community mobilization techniques applied in Nepal (Box 3) showed a significant decrease in neonatal and maternal mortality. Women in the intervention areas of the MIRA study were more likely to access prenatal care, more likely to deliver in a health care facility or with a trained birth attendant, and more likely to engage in hygienic home care.[40]

BOX 6 | The Warmi Project in Bolivia[38]

What Is It?	■ A gender-sensitive community participatory methodology (Community Action Cycle) for women's groups in remote areas with limited access to health services ■ Aim: Reduce maternal and perinatal mortality
Main Components	■ Initiated and strengthened women's organizations ■ Developed women's skills in problem identification, prioritization, planning, and implementing family and community education in safe birth ■ Trained community members, TBAs, and husbands in safe birthing techniques ■ Used women's health care picture cards for autodiagnosis process ■ Incorporated community mobilization activities to support behavior changes ■ Used tools such as birth kits, midwife manuals, radio programs
Where Tested?	■ Inquisivi Province, Bolivia (1990–1993) ■ Evaluated by comparing perinatal mortality rates and obstetric behavior among women before and after the intervention

Main Results	■ Perinatal mortality rates decreased 65% from baseline (117 per 1000 births to 43.8 per 1000 births)
	■ Significant increase in:
	  ■ Number of women participating in women's groups
	  ■ Number of women who received antenatal care
	  ■ Number of women who breastfed their infants on the first day of life
	■ Increase in percentage of control infants who received immediate care following birth, though this difference was not statistically significant

The Tostan Project, another community-based program that has been successful in improving maternal health by raising awareness of harmful practices, has helped communities abandon both female genital cutting and "early and forced marriage," which they regard as violations of women's and girls' rights to physical integrity and health.[41] Female genital cutting is associated with significantly higher risks of tearing and stillbirths.[42] An evaluation of Tostan's work found that over 90% of the 600 women who participated were aware of their right to health, the use of ANC increased, and the prevalence of female genital cutting among the daughters of women participating in the program decreased.[43] The Saksham Shivgarh project in

India has shown a 50% reduction in neonatal mortality through community mobilization and behavior change communication to promote essential newborn care, including birth preparedness, clean delivery, immediate breastfeeding, skin-to-skin thermal care, and hygienic cord and skin care.[44]

Community mobilization has been effective in changing care-seeking behaviors.[45] However, many communities do not know how to start the mobilization process. Nongovernmental organizations, governmental organizations, and advocacy groups may need to work closely with community groups at the beginning of the process. Outside support should encourage and allow group formation, but should not dictate specific activities.[46] Once started, the group should make the decisions about what is of primary importance and how to solve problems. Once a community-based solution is implemented, community groups may be assisted to evaluate their own progress by using indicators, such as reviewing data on appropriate referrals of mothers and newborns by families.

EFFECTIVE INTERVENTIONS AT THE HOUSEHOLD AND COMMUNITY LEVEL

The proven interventions and practice-based evidence for some stages of the woman's lifecycle—preconception, antenatal, birth, immediate postpartum, late postpartum—and the newborn's first month of life are discussed in this section.

Preconception

The following household and community-based interventions to improve maternal and newborn health should be directed toward young girls and women before they become pregnant (Box 7: Preconception Interventions).

BOX 7 | Preconception Interventions

1. Improve nutrition and overall health of girls
2. Promote gender equity
   - Educate girls
   - Prevent gender-based violence
   - Delay marriage/childbirth age
3. Immunization
4. Promote safe sex

Improve nutrition and overall health of girls | Poor nutritional status of girls and women can contribute to poor maternal health, obstetric complications, and poor birth outcomes.[47] Supplementation of iron and vitamins, including Vitamin A, can be provided to children and adolescents through school-based programs.[48] Substantial research has shown that folic acid supplementation before pregnancy

prevents neural tube defects in infants. Routine folic acid fortification of a commonly consumed food, such as flour, is recommended.[49] It is important to prevent and treat diseases that contribute to anemia, particularly malaria. One such intervention is to have community outreach workers distribute insecticide-treated bed nets (ITNs) in malaria-endemic areas.[50]

Promote gender equity |

■ *Educate girls:* The strong positive relationship between maternal education level and survival of infants is well known.[51] Community-based outreach can encourage families to send their girls to school, as well as to encourage schooling past the primary level.[52]

■ *Prevent gender-based violence:* While effective community interventions to address gender-based violence are currently being evaluated,[53] studies have suggested physical violence against pregnant women increases the risk of preterm labor and delivery, fetal death, and low birth weight. In a study conducted in Nicaragua, a statistically significant 40% increase in under-5 mortality was found for mothers who reported violence.[54] Promising approaches to community-based interventions include public campaigns that reach out to men and to youth, as well as campaigns to change social norms that validate or promote gender-based violence.[55]

■ *Delay marriage and first pregnancy, and prevent unsafe abortion:* Life skills training and economic empowerment programs assist girls to delay age at marriage and first birth, and avoid unwanted pregnancies. Community-based distribution programs for reproductive health information and family planning methods are effective, low-cost, and sustainable.[56]

Immunization | Tetanus is a killer of mothers and newborns. Community education efforts in Pakistan were effective in increasing the number of women immunized against tetanus, thereby cutting the rate of newborn tetanus deaths by half.[57] School-based immunization services can also increase immunization among pupils.[58]

Promote safe sex | Community-based educational interventions can promote safer sex before and during pregnancy to prevent sexually transmitted infections and HIV/AIDS. This includes condom distribution and information on decreased risk behaviors, such as reducing partners, and abstinence.[59]

Antenatal

Community-based programs help to ensure that all pregnant women receive basic ANC either through home visits or by community mobilization to increase utilization of facility-based ANC. In communities

where the majority of women give birth at home, women, families, and communities must be taught birth preparedness. This includes how to recognize danger signs of complications, how to give emergency first aid, and how to prepare emergency transport plans. (Effective ANC interventions are noted in Box 8: Antenatal Interventions.) A strategy found effective in supporting many of these ANC interventions is a series of facilitated group discussions. The MIRA study (Box 3) found that this approach increased women's use of ANC.[60]

BOX 8 | Antenatal Interventions

1. Quality ANC through mobile/outreach clinics
2. Tetanus toxoid immunization: home-to-home campaigns
3. Birth preparedness
4. Recognition of danger signs
5. Breastfeeding preparation and counseling
6. Preventive treatment and bed nets for malaria prevention, where appropriate
7. Prevention, detection, and treatment of maternal syphilis, when appropriate
8. HIV counseling at home/community
9. Nutrition: micronutrient supplementation, community-based distribution of iron/folate
10. Promotion of safe sex practices

Quality ANC | Quality ANC is more important than quantity. A large multi-center study found that four high-quality, goal-oriented ANC visits provided the same level of care as the standard ANC of eight visits,[61] with no difference in maternal or newborn outcomes. A program based on four focused antenatal visits could reduce time and funds needed by the family and by the system providing care.

Tetanus toxoid immunizations | Tetanus toxoid prevents death from tetanus in pregnant women and their infants. If a pregnant woman is not fully immunized during childhood and adolescence, or her immunization status is unknown, she can be immunized during ANC.

Birth preparedness | The effectiveness of community interventions for birth preparedness still requires rigorous testing.[62] Behavior change communications and simple interventions have been implemented at the home and community-level. Examples are shown in Boxes 2, 3, 5, and Box 9: Project for Advancing the Health of Newborns and Mothers (Projahnmo) in Bangladesh.

INDONESIA: Midwife listening to fetal heart

Save the Children/Robert Maass

Recognition of danger signs | Teaching people in the household and community the danger signs of complications requiring emergency care can mobilize women, their partners, and entire communities to save the lives of women and infants. Information on how to recognize danger signs of any complication can be taught to household and community members through media campaigns, community meetings, and posters in clinics and schools, as well as through programs of song, dance, and theatre.

Breastfeeding counseling | Counseling points include: initiating breast-feeding within about 1 hour of birth; establishing correct breastfeeding

BOX 9	Project for Advancing the Health of Newborns and Mothers (Projahnmo) in Bangladesh[63]
What Is It?	■ A formative research program focused on home care and health education by health workers ■ Aim: Reduce neonatal mortality

Main Components	■ Included: Behavior change communication, management of newborn illness, strengthening of existing health facilities using pregnancy surveillance, birth preparedness, home visits during pregnancy and postpartum, home and clinic management of maternal and newborn complications
	■ Trained all workers:
	  ■ CHWs and TBAs in home care and health education
	  ■ Community mobilizers in health education
	  ■ Clinic health workers in home care, health education, and training of CHWs and TBAs
	■ Supplied home care essential equipment and drugs

Where Tested?	■ Sylhet, Northeastern Bangladesh (2002–2006)
	■ Cluster-randomized trial evaluating two service delivery models:
	  ■ Home care: Two monthly pregnancy surveillance by CHWs; Antenatal home visits for education/negotiation/selected services (3 mo and 8 mo); postpartum visits (1, 3, 7 days) to screen and manage sick newborn; strengthening existing health delivery systems of the Government and NGOs to provide improved maternal and neonatal care at facility
	  ■ Community Care: Community education, mobilization, and advocacy; strengthening existing health delivery systems of the Government and NGOs to provide improved maternal and neonatal care at facility
	  ■ Comparison arm: usual existing health care at health facility

Main Results	■ Greatest improvement seen in home care arm. An end line survey is in process now (2006). Selected findings of MIS and repeat sample household surveys from baseline in Jan 2003 to Sept 2005:
	  ■ Use of antenatal care services: baseline 47%, 2005 71%
	  ■ Uses iron folate during pregnancy: baseline 41%, 2005 85%
	  ■ Use of trained TBAs: baseline 9%, 2005 42%
	  ■ Use of clean cord cutting: baseline 46%, 2005 94%
	  ■ Initiation of breastfeeding within 1 hour after birth: baseline 13%, 2005 79%
	  ■ Apply nothing to umbilical cord: baseline 9%, 2005 63%
	  ■ Delay in bathing baby for 3 days: baseline 2%, 2005 45%

skills, including good positioning and attachment; breastfeeding exclusively without other liquids or foods; and practicing frequent and on-demand feeding (including night feeds). Availability of community resources—such as community health workers and mother-to-mother support groups—helps women when they are breastfeeding.[64] A randomized controlled trial in Bangladesh significantly improved breastfeeding practices with peer counseling, resulting in a prevalence of exclusive breastfeeding at 5 months in 70% of the intervention group and 6% of the control group.[65] If a woman is known to be HIV-positive, counseling is essential to assist in infant feeding decisions.[66]

Intermittent preventive treatment and ITNs for malaria | ITNs used during pregnancy can protect women from malaria. This practice can decrease severe malaria by 45%, reduce premature births by 42%, and decrease low birth weight in newborns.[67] Malaria during pregnancy is associated with maternal anemia, increased preterm birth, low birth weight, and neonatal and maternal mortality, particularly among younger, first-time mothers.[68] The Roll Back Malaria Initiative recommends the use of intermittent preventive treatments for pregnant women in malaria-endemic areas.[69] ITNs used during pregnancy reduce neonatal and perinatal mortality.[70]

Prevention, detection, and treatment of syphilis | Syphilis is a major cause of fetal death. Screening for and treating syphilis during pregnancy is

a lifesaving intervention.[71] Simple, low-cost, rapid, point-of-care diagnostic tests can be used at the lowest level of health care.[72] However, further research is needed on community-based strategies to encourage syphilis screening during ANC, and to ensure condom use and adherence to treatment regimens for both male and female partners.[73]

Voluntary counseling and testing (VCT) for HIV and prevention of mother-to-child transmission (PMTCT) of HIV | Many mothers do not know their HIV status; in these cases, exclusive breastfeeding should be promoted and supported. Community education and mobilization in Zimbabwe have been used successfully to raise HIV/AIDS awareness and overcome barriers to ANC and VCT.[74] A study in Kenya on the impact of both male support of and community education about PMTCT yielded positive results. Both actions led to a significant increase in VCT among male partners of antenatal clients, and a significant increase in the disclosure of HIV results by both women and men to their partners.[75] Providing people, particularly youth, with the option of VCT at home (rather than clinic-based counseling) can be effective in increasing the number of people who access VCT. In Zambia, the option of a home visit by an HIV counselor resulted in an increased acceptance of counseling and testing by 71%.[76]

MALI: Woman and newborn

Save the Children/Michael Bisceglie

Nutrition | Women often know what to eat but do not have food, access to land to grow food, control over the land or food, or access to money to get food. Poverty, lack of access to quality foods and, sometimes, traditional beliefs about dietary restrictions during pregnancy can be obstacles to adequate nutrition. Pregnancy increases the need for calories, iron, iodine, Vitamin A, and other micronutrients. Potential benefits of iodine supplementation in deficient populations include reduced neonatal mortality and neurologic deficits. Although iodine has been added to drinking water and salt, there is still a need to develop innovative means of providing iodine supplements during pregnancy.[77] There is a strong association between maternal malnutrition and low birth weight. In addition to eating an extra meal each day, pregnant women should have an adequate amount of foods rich in Vitamin A, iron, and folate. In Malawi, a community-based nutrition education and iron distribution campaign led to reductions in anemia.[78] A study in Indonesia demonstrated that TBAs were effective in distributing and monitoring the intake of iron/folate tablets and in educating pregnant women about anemia treatment and prevention.[79]

Safe sex and contraception counseling conducted by peer educators or in community groups | Consistent use of condoms during pregnancy will help women avoid infection, reinfection, and/or further transmission of HIV and sexually transmitted infections. Community-based contraceptive counseling can increase couple communication and the use of contraception postpartum.[80]

Birth and immediate postpartum

Labor, delivery, and the immediate postpartum period (first 6 hours) are the most critical times for lifesaving measures for mothers and newborns. The specific effective interventions during labor and postpartum care may differ depending on whether a woman gives birth at home alone, or with a family member, TBA, CHW, or skilled attendant.[81] Interventions organized by type of labor attendant are described for mothers in Table 2 and for newborns in Table 3.

Scenario 1: Home birth with family member

As previously discussed, community interventions that increase birth preparedness increase linkages with health facilities. Currently, these interventions are accepted as practice-based evidence, as few studies have examined their effectiveness.[82] A project carried out in seven states of Guatemala using mass media activities and community mobilization found that knowledge of danger signs improved significantly among both women and men. Moreover, women who were exposed to these activities were significantly more likely than those who were not to have put aside money and have an emergency plan for transportation.[83]

Promote clean delivery practices | In preparation for the delivery, ensure that the place where the birth will occur and the toilet are clean; the mother and helpers bathe and wear clean clothes; and the items needed for the birth are cleaned and stored in a clean, covered container. Handwashing is also an important aspect of a clean delivery. The provision of clean home delivery kits—which may include soap, plastic sheeting, pictorial instruction, gloves, aprons, cord ties, a clean razor blade, and a cotton cloth to wrap the newborn infant—is a potentially effective intervention. A study in Tanzania found that families using clean delivery kits had decreased maternal and newborn infections.[84] Clean delivery kits should be promoted in the context of broader behavior change communications regarding clean delivery practices.[85] (Refer to Boxes 3 and 6 for more information.)

Promote safe birth interventions | Best practice interventions that can be done at household and community level include: drinking fluids during

labor; position changes; squatting in the second stage to increase the pelvic diameter; external uterine massage after delivery of the placenta; and immediate breastfeeding to encourage uterine contractions that decrease postpartum bleeding.[86] Evidence from over 14 clinical studies has demonstrated that the continuous presence of a supportive person during labor decreases poor maternal outcomes.[87]

Prevent prolonged labor to avoid obstructed labor, newborn mortality, ruptured uterus, and fistula | Community-based safe motherhood interventions can teach community members how to support a woman in labor and to set acceptable time limits for the duration of labor. A project in India aimed to train safe motherhood volunteers and advocates to educate women and family members on the dangers of obstructed labor, and found that the proportion of women who were aware that labor over 12 hours was a danger sign increased by 30% as a result.[88]

Prevent and recognize postpartum hemorrhage | Family and community members can be taught to remind the mother to pass urine often and to perform external uterine massage to help keep the uterus contracted after the delivery. In a study in Indonesia, community volunteers provided women with information about the prevention of postpartum hemorrhage and distributed misoprostol tablets. Study results indicated that women could understand the information provided, act on it appropriately, and safely take misoprostol at the correct time.[89] While promising, this approach must be tested in other settings to assess the evidence of effectiveness and safety. A study in Tanzania found that the use of a commonly recognized measurement, the kanga (or woman's sarong), was helpful in teaching community members when to transport a bleeding woman. If a woman had soaked two kangas, this represented hemorrhage and was the sign to transport.[90]

MALI: Mother breastfeeding her newborn

Save the Children/Dr. Houleymata Diarra

Early and exclusive breastfeeding | Extensive evidence shows that behavior change communication strategies at the household and community level increase immediate and exclusive breastfeeding.[91] Community mobilization during the HBLSS training in India (Box 5) resulted in an increase of breastfeeding within 1 hour of birth from 1.7% to 76.2%.[92]

Keep infant warm and dry | Newborn hypothermia is a major cause of neonatal mortality. A program in India in which community women were trained to keep newborns warm and to refer infants who could not maintain their body temperatures reported a decrease in neonatal mortality, as

TABLE 2 Mother Interventions—Birth, Immediate, and Emergency Care	HOME BIRTH		
	Alone or with Family	With TBA or CHW	With Skilled Attendant
1. Prevent Delays: ANC counseling, educate woman and family, conduct community mobilization activities on:			
■ Birth planning	✓	✓	✓
■ Recognition of danger signs	✓	✓	✓
■ Emergency first aid	✓	✓	✓
■ Emergency planning for referral (money, transportation, decision-maker, assistance from others)	✓	✓	✓
2. Prevent Infection:			
■ Clean delivery place	✓	✓	✓
■ Clean hands and hand covers	✓	✓	✓
■ Clean birthing woman	✓	✓	✓
■ Clean cord cutting (delivery kit)	✓	✓	✓
3. Promote Safe Birth Practices:			
■ No drugs to speed labor	✓	✓	✓
■ Food and drink during labor	✓	✓	✓
■ Position changes during labor	✓	✓	✓
■ Limit vaginal examinations	✓	✓	✓
■ No fundal pressure	✓	✓	✓
4. Prevent Prolonged Labor:			
■ Labor monitoring	Time Limits	Simple Partograph	Partograph
■ Social support	✓	✓	✓
■ Food and drink during labor	✓	✓	✓
■ Pushing position during birth	✓	✓	✓
5. Prevent/Manage Postpartum Hemorrhage:			
■ Active management of third stage	—	—	✓
■ Urinating/squatting to deliver placenta	✓	✓	✓
■ Manual removal of placenta	—	—	✓
■ Uterine massage/uterine compression	✓	✓	✓
■ Compression at bleeding site	✓	✓	Suture lacerations
■ Position woman for shock	✓	✓	✓
■ Uterotonics/oxytocics	Oral/sublingual	Oral, rectal, Uniject	Oral, rectal, IM, IV
■ Non-pneumatic anti-shock garment	—	✓	✓
6. Other Emergency First Aid:			
■ Fluids	Oral	Oral, rectal	Oral, rectal, IV
■ Dry and warm for shock prevention	✓	✓	✓
■ Antibiotics	—	Oral, IM	Oral, IM, IV
■ Magnesium sulfate	—	—	✓
■ Stabilize on way to referral site: lie down, cover, reassure, emergency care for complications	✓	✓	✓

Source: ACNM-Home Based Life Saving Skills 2004, adapted and modified 2005.

TABLE 3 Newborn Interventions—Immediate and Emergency Care	HOME BIRTH		
	Alone or with Family	With TBA or CHW	With Skilled Attendant
1. Early and Exclusive Breastfeeding	✓	✓	✓
2. Newborn Care:			
■ Dry with one cloth	✓	✓	✓
■ Warm, skin-to-skin contact, cover with another dry cloth	✓	✓	✓
■ Cord and eye care	✓	✓	✓
■ Delay bath for 24 hours	✓	✓	✓
3. Help Newborn Breathe:			
■ Warm	✓	✓	✓
■ Clear mouth and nose	✓	✓	✓
■ Position	✓	✓	✓
■ Stimulate	✓	✓	✓
■ Breathe into baby	Mouth-to-mouth (mother)	Tube and mask, bag and mask	Bag and mask
4. Help Low Birth Weight Newborn:			
■ Feed every 2 hours	✓	✓	Tube feed
■ Warm, skin-to-skin contact	✓	✓	✓
■ Cup feed expressed breast milk, if necessary	✓	✓	✓
■ Baby sleep with mother	✓	✓	✓
5. Help Sick Newborn:			
■ Warm, skin-to-skin	✓	✓	✓
■ Clear airway	Mouth suck (mother)	Suction device	Suction device
■ Stimulate	✓	✓	✓
■ Feed every hour	✓	✓	✓
■ Give antibiotics	Refer	Oral antibiotics	Oral, IM, IV antibiotics
6. Stabilize on way to referral site: hold, cover, give breast milk, comfort, emergency care for complication	✓	✓	✓

Source: ACNM-Home Based Life Saving Skills 2004, adapted and modified 2005.

well as an increase in newborn referrals.[93] A mother or family member may effectively prevent infant hypothermia during and after birth by drying and wrapping the infant, covering the infant's head, and delaying the first bath.

Help newborn breathe | Making sure the newborn can breathe is a top priority for home and community-based interventions for saving newborn lives.[94] In Ethiopia, household members were trained to help newborns breathe at birth by holding the baby (position), wiping the face (nose and mouth) and body, rubbing the back for stimulation, and warming the baby with skin-to-skin contact. These actions, along with care for the

woman, are called "First Actions – after the baby is born." The home-based management score of women attended by HBLSS-trained women for "First Actions" was 89%, compared with 32% for women assisted by non-HBLSS-trained women.[95] Bulb syringes (mucus bulbs, enema syringes, or ear syringes) found frequently in households are sometimes used when a baby has thick mucus. This may be considered a best practice in some places; however, evidence was not found to support this suction device for a baby who is having trouble breathing.

Scenario 2: Home birth with traditional birth attendant or community health worker

Community-based caregivers such as TBAs or CHWs may be trained to teach and help families with a pregnancy as well as those preparing for birth and complications, conducting a clean and safe birth, and caring for a baby after its birth. The community-based caregiver should have knowledge about danger signs and emergency first aid skills.

In addition to the interventions in Scenario 1, a TBA or CHW, when assisting a woman giving birth at home, may also be trained to use a simplified partograph, active management of the third stage of labor, oxytocin in Uniject™ (a safe, one-time injection), misoprostol, the non-pneumatic anti-shock garment (NASG), and bag and tube resuscitation.

AFGHANISTAN: Learning to use a partograph

JHPIEGO

Partograph | Large, multi-center trials have demonstrated the effectiveness of a simple, printed partograph to follow the progress of labor when used by skilled attendants.[96] Labor surveillance, including the use of the partograph, was found to reduce early neonatal deaths by 40%.[97] In some developing country settings, the partograph has been adapted or simplified for peripheral facilities.[98] A best practice in southeastern Nigeria during the 1970s supported trained midwives using the Philpott partograph to monitor labor for home birth.[99] Simplified partographs are being piloted for use in the households by TBAs and CHWs who may not be able to read or write.[100]

Active management of the third stage of labor | A key evidence-based practice for prevention of postpartum hemorrhage is active management of the third stage of labor. This includes administration of oxytocin with the delivery of the baby's anterior shoulder or up to 1 minute after the delivery of the baby, controlled cord traction, and uterine massage after the delivery of the placenta. Large, randomized controlled trials found active man-

VIETNAM: Happy mother and newborn

Save the Children/Michael Bisceglie

agement of third stage effective in maternity hospital settings; however, there is relatively little evidence regarding the use of active management in home deliveries.[101] In Nepal, trained maternal and child health workers participated in a 6-week refresher training course in midwifery skills, including active management of third stage of labor. Those health workers who completed training also received an emergency kit that included medications and supplies for active management. A clinical assessment using participatory techniques—including role-play and model demonstration—found that 71% of those who were trained could demonstrate active management, compared to 13% of those who were untrained.[102]

Uniject oxytocin | An injectable medication, oxytocin, has been proven to reduce postpartum hemorrhage; however, there are problems with storage, administration, and infection control in low-resource settings. One potential solution for community and home-based use is delivery of oxytocin in the Uniject, a single-use, pre-filled injection device. Traditional midwives have successfully used Uniject devices for delivery of tetanus toxoid in Bolivia and Mali.[103] A hospital-based study in Angola found a reduction in postpartum hemorrhage from 40% to 8% with active management using Uniject, compared to expectant management.[104] Further research is needed to assess whether TBAs and CHWs could successfully administer Uniject to reduce postpartum hemorrhage.

Misoprostol | This low-cost drug has proved promising for prevention and treatment of postpartum hemorrhage at community and facility levels. Because misoprostol does not need refrigeration and can be given without injection, it is being studied as an alternative uterotonic, especially in settings where oxytocic drugs are not available or feasible.[105] Field demonstration programs, modeled on the Indonesia community-based misoprostol program, are being implemented in Nepal and Afghanistan to demonstrate the safety, efficacy, feasibility, and program effectiveness of community education and community approaches for prevention of postpartum hemorrhage using misoprostol. Use of misoprostol by pregnant women before the onset of or during labor has not been documented in any community study conducted to date. However, programs must be aware of the potential for incorrect or inadvertent use of the drug during the first or second stage of labor, and take appropriate precautions when setting up community-based distribution of misoprostol programs. Much information on efficacy is being gathered, but further research is also needed on the effectiveness, acceptability, and safety for use of this drug at the household and community level.[106]

The non-pneumatic anti-shock garment | The NASG is another promising approach. Made of neoprene and Velcro®, it is wrapped tightly around the

woman's abdomen and legs as a first aid device that reverses shock and decreases bleeding in the lower body. It has been proposed as one solution to overcoming delays in reaching emergency obstetric care for obstetric hemorrhage.[107] Although a case series[108] and pilot studies[109] indicate that the NASG substantially decreased blood loss in women with obstetric hemorrhage, it is still unknown if the early application of the NASG will reduce mortality and severe morbidity. Because the garment is relatively low-cost, reusable, and can be applied by persons with minimal medical background after a brief training, it has the potential to be used where births are mostly assisted by TBAs or CHWs. In one program in rural Mexico, the NASG was kept at the primary health care center. Non-medical CHWs were successfully trained to use the garment, allowing time for safe transport to emergency obstetric care facilities. Outreach was then conducted to inform TBAs about the NASG—what it could do and where it could be found.[110]

BOX 10 | Society for Education, Action, Research in Community Health (SEARCH) in India[112]

What Is It?	■ Home-based neonatal care by literate, trained village health workers ■ Aim: Reduce the neonatal mortality rate where hospitals are inaccessible and costly

Main Components	■ Trained all workers:
	  ■ Home-based neonatal care
	  ■ Management of neonatal sepsis (septicemia, meningitis, pneumonia) using two antibiotics (oral cotrimoxazole and injectable gentamicin)
	■ Ensured cooperation with community, TBAs, and health services
	■ Used audio-visuals and group games for health education:
	  ■ Mothers during home visits before and after birth
	  ■ Mothers of high-risk neonates
	■ Village health workers attended deliveries, along with TBA
	■ Village health workers conducted home visits (8–12) during neonatal period to ensure breastfeeding, thermal care, hygiene, and to monitor baby for any infection (sepsis)

Where Tested?	■ Gadchiroli District, Maharashtra, India (1993–2003) ■ A randomized controlled trial of home-based neonatal care by village health workers to develop and test a low-cost approach of delivering primary neonatal care at the home and community, and to evaluate its effect on neonatal mortality
Main Results	■ 93% of neonates received home-based neonatal care ■ 84% of neonates were attended at birth ■ 81% of neonates with suspected sepsis were correctly diagnosed/treated ■ Neonatal mortality rate decreased by 62% in year 3 (1997–1998) and by 70% in 2001–2003 ■ Case fatality rate from neonatal sepsis significantly decreased from 163 cases (16.6%) before intervention to 71 cases (2.8%) after intervention ■ Low birth weight decreased by 16% (preterm birth was unchanged) ■ No complications noted with use of injections for treatment, but use of pre-filled, disposable syringes or Uniject device is recommended ■ Intervention was cost-effective compared to hospital-based care in urban India

Help newborns breathe | The available evidence suggests that TBAs and CHWs can be trained to help the newborn breathe.[111] A randomized controlled trial conducted in India (Box 10: Society for Education, Action, Research in Community Health [SEARCH] in India) reduced the asphyxia-related neonatal mortality by 65% in newborns born at home. Instead of a TBA working alone, a team of a TBA and a semi-skilled village health worker were trained together in newborn resuscitation. The bag and mask were used and appeared to be more effective than a tube and mask or mouth-to-mouth breathing, as well as more convenient to use. The

estimated equipment cost of a bag and mask was $13 per death averted.[113] In Indonesia, village midwives have been trained to effectively use tube and mask.[114] A study conducted in India, Indonesia, Bangladesh, and Iran found that illiterate TBAs could be trained to help newborns breathe and could retain their skills over time.[115] Large-scale effectiveness trials to test different resuscitation strategies are needed.[116]

Clean delivery practices | Health systems or projects could provide the necessary equipment and supplies for a clean delivery via clean delivery kits or as individual items. Providing equipment and supplies through birthing kits, or the basic supplies necessary for a clean delivery, may be done by health systems and/or projects.[117] In a recent cluster-randomized trial in Pakistan—in which trained TBAs were provided with and trained to use a clean delivery kit, lady health workers linked TBAs with established services, and obstetrical teams provided outreach clinics for ANC—perinatal death was reduced by 30% and maternal mortality by 26%.[118]

CAMBODIA: Woman and healthy daughter

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Scenario 3: Home birth with skilled attendant

Skilled attendants can provide excellent care for women who face barriers to delivery in health facilities or who want to remain in the home for birth. In some developed countries, home delivery with skilled midwives is considered the best care.[119] The MotherCare Program in South Kalimantan, Indonesia trained skilled midwives in Life Saving Skills, increasing the percentage of women having a skilled attendant as well as having home visits postpartum.[120]

In addition to the interventions described for Scenario 1 and Scenario 2, a skilled birth attendant with adequate, appropriate supplies and equipment can administer intravenous (IV) fluids and/or IV antibiotics, give safe injections, monitor labor using the standard World Health Organization partograph,[121] administer magnesium sulfate to prevent/manage eclamptic seizures, practice active management of the third stage of labor with injectable oxytocin, help the newborn breathe, and carry out other first-line interventions for hemorrhage and hypertension.[122] Skilled attendants can carry essential emergency drugs and supplies.[123] They may also be able to manually remove the placenta or suture lacerations to prevent a woman from bleeding to death before reaching a health facility.[124]

Late postpartum and neonatal

The later postpartum period extends from 6 hours to 6 weeks after birth. Box 11: Late Postpartum and Neonatal Interventions lists effective interventions at the household and community level for this period. Further explanation of late postpartum and neonatal interventions follows.

BOX 11 | Late Postpartum and Neonatal Interventions

WOMAN INTERVENTIONS

1. Woman danger signs: recognize and respond
2. Prevent woman bleeding and infection (e.g., rest, hygiene, etc.)
3. Schedule of regular postpartum visits
4. Nutrition counseling
5. Contraception and safer sex

NEWBORN INTERVENTIONS

6. Newborn danger signs: recognize and respond
7. Breastfeed exclusively and on demand
8. Keep infant warm
9. Cord and skin care
10. Pneumonia/sepsis early identification and care
11. Schedule of regular newborn visits

Danger signs | Teaching people in the household and community danger signs of postpartum complications requiring emergency care can mobilize women, their partners, and entire communities to save the lives of women and infants. It is important to remember that knowledge, planning for complications, and response to danger signs for the postpartum period for mothers and newborns increases linkages with health facilities and thus reduces delays to emergency care.

Prevent postpartum bleeding and infection | Early recognition of danger signs—especially fever and bleeding—can decrease maternal deaths postpartum.[125] ITNs in malaria-endemic areas are recommended as they were prior to and during pregnancy to protect both the woman and newborn.

Schedule of regular postpartum/newborn visits | Both mother and infant should be monitored during the highest risk times: the first 24 hours, at least twice in the first week, and again in the second week after delivery.[126] The ideal number and frequency of visits, as well as the level of care provider, can be tailored to the needs of the community. In India, SEARCH trained village health workers to conduct home visits during the neonatal period (Box 10). This resulted in a 70% decrease in the neonatal mortality rate and an 82% decrease in deaths from neonatal sepsis.[127]

Nutrition counseling | Ideally, the breastfeeding mother needs about 500 calories more than a non-breastfeeding woman each day—an extra share of the best foods available—just as she did in pregnancy. These foods provide adequate protein, vitamins, and minerals including iron, calcium, Vitamin A, folic acid, and iodized salt, and are needed through 2 years of breastfeeding.[128]

Birth spacing, contraception, and safer sex | Access to family planning has been shown to be closely related to decreasing maternal mortality.[129] Children born 3 to 5 years after a previous birth are twice as likely to survive as children born less than 2 years apart. Birth spacing also increases the likelihood of maternal survival. Compared with women who give birth at 9 to 14 month intervals, women who have their infants at 27- to 32-month birth intervals are 2.5 times more likely to survive childbirth.[130]

The lactational amenorrhea method is an inexpensive, natural postpartum method of contraception that prevents pregnancy until the infant is 6 months old. CHWs and TBAs can teach the method to mothers who exclusively breastfeed (or feed at least 6 times within 24 hours, day and night). Counseling on dual protection (the use of a condom alone or in combination with another contraceptive method) to prevent sexually transmitted infections, HIV, and unplanned pregnancy is especially important while breastfeeding.

Community awareness programs, such as theatrical performances about the need for postpartum family planning, have increased knowledge of postpartum family planning from 0% to over 55% in Egypt.[131]

Newborn danger signs | The most common danger sign the mother will see in her infant is that the infant appears to have no interest in or poorly sucks the breast. This may be accompanied by other signs including fever, baby feeling cold, crying, convulsions, or discharge of eyes/cord stump. Every mother and family member needs to have the knowledge of and a planned response to danger signs in the infant should they arise.

VIETNAM: Father doing Kangaroo Mother Care

Save the Children/Michael Bisceglie

Breastfeed immediately, exclusively, and on demand | Community mobilization and behavior change strategies can address cultural prohibitions on immediate breastfeeding for women who are HIV-negative. A study in peri-urban Mexico City found that early and repeated contact with peer counselors increased exclusive breastfeeding, increased duration of breastfeeding, and decreased infant diarrhea.[132] When women are HIV-positive, additional counseling concerning breastfeeding is needed.

Keep infant warm (thermal regulation, hypothermia prevention) | As discussed in Scenario 1, newborn hypothermia is a major cause of neonatal mortality. In Uttar Pradesh, India, behavior change and community mobilization efforts led families to adopt skin-to-skin care to keep newborns warm.[133] A few studies have demonstrated that treating infants' skin with oil through newborn massage, a traditional practice in some cultures, may reduce heat loss.[134] Kangaroo Mother Care (KMC),

or skin-to-skin care, is a method for keeping small infants warm[135] and includes the three components mentioned in Box 12: Kangaroo Mother Care. KMC for low birth weight infants is also associated with reduced risk of severe illness, lower respiratory tract disease, and greater weight gain at time of discharge.[136] In Bangladesh, where CHWs were trained to instruct pregnant women in KMC, 85% of mothers of low birth weight infants used the method.[137]

BOX 12 | Kangaroo Mother Care

1. Continuous skin-to-skin contact between the infant's front and mother's chest
2. Early and exclusive breastfeeding
3. Support to the mother so that she can maintain the skin-to-skin contact

Cord care | An infection such as tetanus can develop if the instrument used to cut the cord is not clean or if anything unclean touches or is put on the cord stump. Cord stump care consists of washing hands before touching the cord and keeping it clean and dry. In some cultures, it is common to put dung or other contaminated materials on the cord stump, which is dangerous. A project in Senegal (Box 2) trained community women to conduct visits during the first week postpartum, which led to improvements in cord care.[138] In Nepal, cord cleansing with chlorhexidine reduced neonatal mortality by 24% compared to soap and water and dry cord stump care.[139] Behavior change and information, education, and communication campaigns can assist community members to understand the association between newborn deaths and cord care practices.

Care for newborn infection | Five studies have demonstrated that training CHWs to identify pneumonia and provide oral antibiotics for newborns reduced neonatal mortality.[140] In India, SEARCH trained village health workers to successfully diagnose and treat sepsis with oral and injectable antibiotics (Box 10), thereby reducing neonatal mortality from sepsis by 90%.[141]

The best methods to deliver interventions to women and newborns at home will need to be carefully tested to meet the needs, opportunities, and constraints in given situations.[142] Much still needs to be learned about what works and why, and how community-based postpartum care can be formalized and integrated into the health care system.[143]

NEXT STEPS IN SAVING LIVES OF MOTHERS AND NEWBORNS

A comprehensive view of where, when, and why mothers and newborns are dying helps key stakeholders develop targeted, effective lifesaving interventions. If this information is not available or is not reliable, a needs assessment should be conducted. It is important to include all vital stakeholders—including the Ministry of Health, other national health policy or program planners, health systems' managers, health care providers, community leaders, women's group leaders, community members, and others who have a stake in the outcomes or whose support is essential for planning next steps. Community members should be engaged in the needs assessment, not only to provide local knowledge, but also to mobilize the community. This enables communities to diagnose their problems, identify which behaviors might be dangerous to the lives of mothers and newborns, and strategize how to change those behaviors.[146] Reviews of existing data or of new needs assessments may point to problems at the household and community level and/or problems with the quality of care and availability of resources at the facility level (Figure 1). Stakeholders can work together to develop a set of strategies and interventions to attempt to close identified gaps and strengthen linkages within the continuum of care.

AFGHANISTAN: Women meet to discuss health issues

JHPIEGO

According to the practice-based evidence approach, practitioners and policy makers need to evaluate what has worked in other settings and adapt successful approaches and interventions for their own context.[147] Interventions should be tailored to country-specific needs and constraints, as what works in one setting may not necessarily be relevant for another setting without modifications.[148] "Bundling," or packaging interventions, is a quicker and more cost-effective way for piloting and implementation on a larger scale.[149]

Monitoring and evaluation are an integral component of the planning and needs assessment, and applying the health intervention cycle is crucial in assessing progress and making mid-course corrections to reduce maternal and neonatal mortality. Currently, fewer than 10 countries in sub-Saharan Africa have viable vital registration systems.[150] Good record keeping and maintaining vital statistics—including community birth/pregnancy outcome registers appropriate for the country situation, and budgeting adequate money for monitoring activities—are essential.

CONCLUSION

Optimum maternal and newborn care can be delivered only through a continuum of household-to-hospital interventions. Some interventions, such as cesarean deliveries, surgery to repair a ruptured uterus, IV antibiotics for sepsis, and blood transfusions for severe hemorrhage, must be implemented at the facility level by skilled attendants or by specially trained providers. However, these facility-based interventions are not always rapidly or easily available or accessible. Therefore, it is critical to provide home and community-based care and outreach while promoting community mobilization to demand high-quality, facility-based services. Empowered, knowledgeable community members can hold service delivery sites accountable for high-quality care, especially with the support of the political and policy process.

BANGLADESH: Proud mother and her newborn

Save the Children/STC Field Staff

There are still many gaps in our knowledge of home and community-based effective and best practice interventions. However, it is important to differentiate between a lack of evidence and ineffective interventions. Due to the difficulty in examining large numbers of outcomes for mothers and newborns, there are often inadequate sample sizes for determining if an intervention does affect maternal and/or neonatal morbidity and mortality. Frequently, interventions at the community and home level have not been adequately evaluated. When government policy makers, nongovernmental organizations, and other organizations conduct pilot work demonstrating effective interventions, results are not always published. Research at the community level to improve maternal and newborn survival must be part of the intervention.

It is a challenge to understand how to scale-up interventions and packages of interventions that have proven successful. Policy makers and planners of public and private health care systems must collaborate to improve maternal and newborn survival. Policy makers can support an assessment of maternal and newborn health care—including identifying gaps and causes of death—and implementation of feasible, affordable interventions that address priority problems and contextual constraints.

Governments, policy makers, nongovernmental organizations, and other organizations can take a variety of actions to improve maternal and newborn health depending on country needs and constraints. Some actions to consider are as follows:

- Establish a national policy document that:
  - Includes specific objectives for reducing maternal and newborn deaths;
  - Supports the empowerment of women and families as an integral part of the health care team; and
  - Facilitates communities, families, individuals, and advocacy groups (such as the White Ribbon Alliance[151]) to participate in policy making and resource allocation for safe pregnancy, childbirth, and emergency referral services;
- Ensure that maternal and neonatal care policies are in place and politically endorsed at all levels of government;
- Ensure that adequate levels of resources are allocated to maternal and neonatal care at all levels;
- Coordinate donor support for maternal and newborn health;
- Clarify roles and responsibilities of health workers to support, coach, and supervise community workers and TBAs; and
- Use community and facility vital event information to inform program work.

The Millennium Development Goals—global targets for human health, development, and poverty reduction to be achieved by 2015 from the 1990 levels—have now put maternal and newborn mortality and morbidity on all health agendas. Millennium Development Goal 4 is to reduce the death rate for children under age 5 by 67%. Millennium Development Goal 5 is to reduce the maternal mortality rate by 75%. It is every woman's and newborn's right to have a safe pregnancy and safe delivery. Home and community-based interventions are effective in contributing to achieving the goals of saving maternal and neonatal lives. Vital stakeholders—those with an interest in saving the lives of mothers and infants, and armed with the information about interventions that are effective at the household and community level—can collaborate with community members, health care providers, and program planners. Together, they can discover where maternal and neonatal deaths occur, prioritize their health systems' needs, implement proven interventions, and monitor and evaluate their progress toward saving the lives of mothers and infants.

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MOZAMBIQUE: A portrait of two mothers

Save the Children/Michael Bisceglie

OUTSIDE COVER PHOTO CREDITS: *(from right to left)*

VIETNAM: Safe Motherhood Program
Save the Children/Michael Bisceglie

BOLIVIA: A mother kisses her newborn
Save the Children/Michael Bisceglie

ETHIOPIA: A family portrait
Save the Children/Michael Bisceglie

MYANMAR: A woman and her baby
© 2005 Kyaw Winn, Courtesy of Photoshare

TANZANIA: A father and his child wait for the mother at a health clinic
© 2004 Thomas Jaenisch, Courtesy of Photoshare

MALAWI: Kangaroo Mother Care
Save the Children/La Rue Siems

INDONESIA: A couple are soon to have a child

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The ACCESS Program is the U.S. Agency for International Development's global program to improve maternal and newborn health. The ACCESS Program works to expand coverage, access and use of key maternal and newborn health services across a continuum of care from the household to the hospital—with the aim of making quality health services accessible as close to the home as possible. JHPIEGO implements the program in partnership with Save the Children, Constella Futures, the Academy for Educational Development, the American College of Nurse-Midwives and Interchurch Medical Assistance.