Population Reports
Information and knowledge for optimal health
March 2006

Published by the INFO Project, Center for Communication Programs, The Johns Hopkins Bloomberg School of Public Health, 111 Market Place, Suite 310, Baltimore, Maryland 21202, USA
www.infoforhealth.org

Better Breastfeeding, Healthier Lives

How programs and providers can help women improve breastfeeding practices

Roger Lemoyne/UNICEF

Series L, Number 14
Issues in World Health

Photo: A husband helps his wife breastfeed their newborn in the maternity ward at Singburi Hospital, Thailand. Involving spouses is an important aspect of building support for breastfeeding mothers in the household and community.

Key Points

Only breastmilk offers infants and young children complete nutrition, early protection against illness, and safe, healthy food—all at once. Nearly all babies are breastfed to some extent, but far less than half are breastfed in the most beneficial way. Better breastfeeding offers triple value: important improvements in child survival and health, better health for mothers, and temporary contraception. What can governments, programs, and health care providers do to support and enable women to breastfeed better?

Carry out comprehensive strategies. Successful strategies to improve breastfeeding include health care services, communities and families, and government. Health care services offer a valuable point of contact for mothers-to-be and breastfeeding mothers. Mothers also need information, support, and empowerment in the community and at home. Government efforts include enacting appropriate policies, such as supporting breastfeeding mothers in the workplace. Changes can begin in any of these areas, but an effective strategy works in all three.

Promote breastfeeding for birth spacing. Providers can advise women on appropriate contraception during breastfeeding, particularly the lactational amenorrhea method (LAM). A method based on full or nearly full breastfeeding, LAM provides the best health benefits of breastfeeding for the infant and also postpones the next pregnancy for up to six months. Then it encourages switching to another family planning method to space births.

Address the challenges that HIV/AIDS poses for breastfeeding. The AIDS crisis has focused concern on HIV transmission through breastmilk, while drawing attention away from the risks to infant health of not breastfeeding. World Health Organization (WHO) and United Nations (UN) agencies recommend, particularly where safe alternatives to breastmilk are not available, that HIV-positive women breastfeed their infants exclusively for the first months of life before switching completely to replacement foods when possible. Exclusive breastfeeding poses half the risk of HIV transmission as mixed breastfeeding, while preventing deaths from other illnesses.

See Companion INFO Report on Breastfeeding "A Guide for Providers"

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Population Reports appreciates the assistance of the following reviewers: Marcos Arevalo, Jean Baker, Bruno Benavides, Jane Bertrand, Annette Bongiovanni, Gloria Coe, Judy Levan Fram, John Howson, Monica Jasis, Mihira Karra, Miriam H. Labbok, Luann Martin, Anne Perrine, Ellen Piwoz, Malcolm Potts, Timothy C. Quick, Jay Ross, Pauline Russell-Brown, Stephen Settimi, James Shelton, Bulbul Sood, J. Joseph Speidel, Maryanne Stone-Jimenez, Youssef Tawfik, Melissa Vickers, Mary Beth Weinberger, and Kim Winnard.

Suggested citation: Setty, V. "Better Breastfeeding, Healthier Lives." *Population Reports*, Series L, No. 14. Baltimore, Johns Hopkins Bloomberg School of Public Health, The INFO Project, March 2006. Available online: http://www.populationreports.org/l14/

Volume XXXIII, Number 3

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Population Reports is published at 111 Market Place, Suite 310, Baltimore, Maryland 21202, USA, by the INFO Project of the Johns Hopkins Bloomberg School of Public Health/Center for Communication Programs

Population Reports is designed to provide an accurate and authoritative overview of important developments in family planning and related health issues. The opinions expressed herein are those of the authors and do not necessarily reflect the views of the US Agency for International Development or The Johns Hopkins University.

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Published with support from the United States Agency for International Development (USAID), Global, GH/POP/PEC, under the terms of Grant No. GPH-A-00-02-00003-00.

Breastfeeding Gains and Goals

Breastfeeding saves infants' lives, provides the best nutrition for infants and young children, and benefits mothers' health. Breastfeeding provides the best health benefits when started immediately after an infant's birth, continued exclusively (without introducing other foods, liquids, or water) for the first six months of life, and then continued along with suitable complementary feeding through age two or longer (see box, p. 5).

Frequent and intense breastfeeding can reliably delay pregnancy for up to six months after childbirth. The lactational amenorrhea method (LAM), as this form of contraception is known, is effective when a woman's menstrual periods have not yet returned and the infant receives no food but breastmilk for the first six months.

Breastfeeding choices are ultimately a mother's individual decision. Women can make informed decisions when health care providers offer information about breastfeeding and support for it. As more women breastfeed, more children survive their first years and grow up healthy. Gains in the practice of any breastfeeding reduce levels of malnutrition and prevent child deaths from diarrhea and pneumonia. Gains in optimal breastfeeding practices reduce risks of illnesses, malnutrition, and early death the most.

A growing percentage of infants are breastfed, according to findings from countries surveyed more than once since 1986 by the Demographic and Health Surveys (DHS) and Reproductive Health Surveys (RHS) programs (see Table 1). Comparable data show that in all but 4 of 65 countries surveyed at least 90% of children are breastfed. Yet only a minority of infants are breastfed in optimal ways (see Table 2, next page). For instance, in most countries less than half of infants are breastfed within one hour of birth. Also, less than half are exclusively breastfeed for the first six months of life.

Breastfeeding practices fall short of the optimal for many reasons. An estimated 60% of births in developing countries are not attended by trained health care workers. In addition to facing greater risk because they lack access to adequate health care, these mothers and babies rarely receive antenatal or extended postpartum health care services that support optimal breastfeeding (251).

Women increasingly work in jobs outside of the home. When women resume full-time employment after childbirth, the separation from their infants makes it difficult to maintain exclusive breastfeeding for the full first six months of the child's life.

Also, many women hold incorrect views about breastfeeding or do not recognize its health benefits (6, 83, 118, 166, 209). Women and their family members may believe incorrectly that breastmilk is not enough to satisfy or nourish their infants. In fact, breastmilk is a complete food and contains all the water and nutrients an infant needs. Others mistakenly believe that breastfeeding too often, or feeding from both breasts, will deplete the supply of breastmilk. In fact, these practices lead to more production of breastmilk. Still others may think that their child is still hungry when the child cries or reaches out and thus give foods other than breastmilk, instead of continuing to breastfeed. Such misperceptions and social pressures about breastfeeding often reflect accepted community wisdom and long-held beliefs.

Programs in many countries report that extending health services into communities helps more women breastfeed exclusively and for longer durations.

Table 1. Breastfeeding Practices Improving

Breastfeeding Trends in Countries with Multiple Surveys Since 1986, by Number of Countries

	% Breastfed Within 1 Hour After Birth	% Breastfed Within 1 Day After Birth	% Exclusively Breastfed Through 6 Months	% Exclusively or Fully Breastfed Through 6 Months	% Breastfed At Least 2 Years
Increased in…	36 countries	37 countries	30 countries	32 countries	27 countries
Unchanged* in…	None	3 countries	3 countries	1 country	2 countries
Decreased in…	8 countries	4 countries	9 countries	9 countries	9 countries

*No change or change was less than 1%

For trends by country, see Web tables 1, 2, and 3 at www.populationreports.org/l14/webtables.shtml

Exclusive breastfeeding refers to feeding infants only breastmilk and no other solids or liquids. Full breastfeeding refers to feeding infants water, water-based drinks and fruit juices (but no other food-based fluid) in addition to breastmilk.

Table 2. Breastfeeding Common but Not Usually Optimal

Breastfeeding Levels, Most Recent Available Surveys, 1994–2005

Percentage of Infants Breastfed…	Unweighted Average Among Countries	Range Among Countries	Number of Countries with Data
Ever	96%	86%-99%	65
Within 1 hour after birth	41%	3%-81%	65
Within 1 day after birth	71%	25%-97%	65
Exclusively up to 3 months	38%	1%-79%	47
Exclusively up to 6 months	31%	<1%-90%	57
Exclusively or fully up to 3 months	62%	19%-90%	47
Exclusively or fully up to 6 months	54%	13%-91%	57
At least 2 years	40%	5%-89%	42

The data presented in Tables 1 and 2 come principally from online DHS STATcompiler <www.measuredhs.com/statcompiler/> tabulations as well as from RHS country final reports. Final DHS country report data have been used in cases where data were not available from STATcompiler. Not all surveys include questions on all the indicators presented in the tables, nor are the respondents defined the same way in all surveys. As a result, the number of countries reported in different sections varies.

For region- and country-specific data, see Web figures 1 and 2 at www.populationreports.org/l14/webtables.shtml

A Call to Action

In 1990 the World Health Organization (WHO) and the United Nations Children's Fund (UNICEF) called on governments, donors, and international organizations to "protect, promote, and support" breastfeeding to improve infant nutrition and survival (269). This call to action, known as the Innocenti Declaration, led to a number of positive steps during the 1990s:

- In 1991 WHO and UNICEF established the Baby-Friendly™ Hospital Initiative to help ensure that maternity clinics encourage optimal breastfeeding practices.
- Many countries appointed national breastfeeding coordinators and developed national breastfeeding policies.
- Countries did more to enforce the 1981 International Code of Marketing of Breastmilk Substitutes, which limits unethical marketing by manufacturers of breastmilk substitutes.

In recent years, however, government and donor support for optimal breastfeeding has declined. Perhaps the main reason is that the AIDS crisis has focused attention on HIV transmission through breastmilk, while drawing attention away from the risks to children's health of not breastfeeding. The mistaken belief that all HIV-positive mothers will pass HIV to their infants through breastfeeding has overshadowed the health and life-saving benefits of breastfeeding (*129*) (see p. 10). At the same time, some manufacturers of infant formula have continued unethical promotion that may discourage breastfeeding.

Concerned about declining national and international commitment to breastfeeding, WHO and UNICEF in 2000–2002 developed the Global Strategy for Infant and Young Child Feeding (*258*). The strategy calls on national governments, health care services, communities, and international donors to apply lessons learned about breastfeeding to better enable and support women to breastfeed optimally.

How To Use This Report

With the help of this issue of *Population Reports* governments, programs, and health care providers can:

- Encourage and support better breastfeeding by carrying out comprehensive strategies involving governments, health care services, and families and their communities (see p. 6).
- Counsel women on how breastfeeding can help space births up to six months postpartum and encourage switching to another contraceptive method thereafter (see p. 11).
- Inform and advise women on HIV and breastfeeding and on weighing the risks of breastfeeding and replacement feeding for HIV-positive mothers (see p. 17).

What Is Optimal Breastfeeding?

Optimal breastfeeding is one of the most effective ways to assure child survival in developing countries (*24*, *108*). WHO and UNICEF have set three guidelines for optimal breastfeeding:

1. Begin breastfeeding the newborn as soon as possible.
2. Breastfeed exclusively (without other foods or liquids) until the baby is six months old.
3. Starting at six months of age, breastfeed with complementary feeding (giving age-appropriate foods in addition to breastmilk) to age two or longer (*258*).

1. Begin Breastfeeding at Birth

Breastfeeding immediately upon an infant's birth—ideally within one hour—stimulates the production of the mother's breastmilk. Immediate or early breastfeeding, as this practice is known, also helps the mother's uterus contract, reducing the risk of heavy bleeding or infection (see pp. 12–13). Feeding infants colostrum—the yellowish milk produced by the mother's breasts during the first days after childbirth—as early as possible is important for a newborn's health. Colostrum contains high concentrations of carbohydrates, protein, and antibodies (acting like a vaccine to prevent infections) and will not irritate the newborn's intestines, as other liquids will.

Also, when mothers breastfeed their infants immediately after birth, hospital staff are less likely to give the baby other liquids—a practice that can reduce the likelihood that mothers will breastfeed exclusively (1, 6, 26).

2. Breastfeed Exclusively for an Infant's First Six Months of Life

Mother's milk alone can fully nourish a baby for the first six months of life. Exclusive breastfeeding helps maintain infant health, promotes growth and development, and increases chances of survival (*122*) (see pp. 12–13). Breastmilk is easy for the baby to digest. During their first six months of life, infants do not need any supplementation (additional food or liquids), not even water. Breastmilk has enough water to quench infants' thirst, even in arid or tropical climates. Animal milk, infant formula, powdered milk, rice water, teas, sugar drinks, and cereal have less nutritional value than breastmilk.

In the first six months of life, water and other liquids or foods normally do infants more harm than good. They increase the risk of diarrheal diseases and other illnesses. Even if not contaminated, they irritate the baby's intestines and cause an imbalance in the protective bacteria in the intestines.

3. Starting at Six Months, Continue Breastfeeding with Complementary Feeding to Age Two or Longer

From the age of six months, babies need a variety of foods in addition to breastmilk. Other foods then provide additional nutrients for normal growth and development. Nonetheless, breastfeeding continues to make an important nutritional contribution well beyond the first six months. Breastfeeding can and should continue through the child's second year and beyond. Breastmilk provides the growing child with energy, protein, and other nutrients such as vitamin A and iron. Where other nutrients are scarce, breastmilk can continue to provide half or more of the young child's nutrients (*253*).

The advice and opinions of family and friends influence many women in their breastfeeding practices. Thus, strategies supporting breastfeeding mothers that include a woman's family and community lead to better breastfeeding, such as avoiding giving foods or liquids other than breastmilk for the first six months of the infant's life.
Illustration: © 2005 World Health Organization

When an infant reaches six months of age, the parents should begin giving a variety of foods, introducing one from each of the different food groups each day. Except in vegetarian settings, animal products should be among the first complementary foods given. Where meat is unavailable or unacceptable, adding other sources of protein such as beans, ground nuts, and eggs or using vitamin and mineral supplements, if available, can help provide needed nutrients. As the child grows, the types of complementary foods can change from semisolid to solid foods, and a greater variety of foods can be given. By 12 months most children can eat the same foods as the rest of the family, as long as the food is prepared so that a child can digest it easily (256).

Comprehensive Strategies Needed

Comprehensive strategies to support optimal breastfeeding can do much to improve infant and child health. Comprehensive strategies can support both a woman's initial decision to breastfeed and her ability to maintain and succeed with her breastfeeding choice. Such strategies include health care workers and facilities, communities and families, and government laws and policies.

Health Care Services Are Key

Health care services offer a valuable point of contact for both mothers-to-be and breastfeeding mothers. In fact, in many countries women report that the advice of health care providers is the main reason for their infant feeding decisions (*76*, 93, 118, 140, 209). To help mothers achieve the best breastfeeding practices, hospitals and other health care facilities can:

Change policies and procedures. Health care providers can inform women about breastfeeding during their pregnancies, for example, during antenatal visits and in childbirth education classes. Information given during pregnancy about immediate and exclusive breastfeeding helps mothers start breastfeeding sooner and breastfeed exclusively for longer (36, 183, 219). Hospitals and birthing centers also can support breastfeeding immediately after a child's birth. For instance, rooming-in practices—that is, placing newborns with their mothers during the hospital stay—encourage early mother-infant contact and suckling (73, *187*).

Train health care workers. Health care providers who serve women in health care facilities and in communities (such as community midwives and health promoters) need to be trained in good breastfeeding practices. They can advise women on optimal breastfeeding, on the dangers of first giving the newborn liquids other than colostrum and of complementary feeding before six months, on breast care, and on dealing with discomfort or difficulties while breastfeeding (see companion *INFO Reports* "Breastfeeding Questions Answered: A Guide For Providers"). Providers also can be trained in good breastfeeding counseling—including that women should never be pressured, obliged, or shamed into choosing breastfeeding or how much to breastfeed.

Preservice and in-service training for health care providers has often neglected the topic of breastfeeding. As a result, providers' practices and recommendations about breastfeeding may be uninformed (1, 6, 83). For example, some hospital staff bottle-feed newborns without approval from mothers. Others advise mothers to give their baby complementary food before six months of age (1, 6, 83).

Changing these unhelpful practices can improve a mother's breastfeeding practices. In a study in the Philippines, for instance, more mothers breastfed their infants exclusively and for longer when health care staff did not give the infants breastmilk substitutes (1). Similarly, a study in an Istanbul hospital found that 66% of infants breastfed by mothers in the hospital were exclusively breastfed at four months—more than twice the percentage of infants who had been given formula in the hospital, at 32% (6).

The Baby-Friendly™ Hospital Initiative. The Baby-Friendly Hospital Initiative, launched by UNICEF and WHO in 1991, encourages maternity facilities to adopt positive breastfeeding policies and services. Facilities are considered Baby-Friendly when they have taken 10 specific steps to support breastfeeding (see box, opposite page).

Since 1991 more than 19,000 facilities in over 130 countries have been designated Baby-Friendly (236, *254*) by WHO and UNICEF. Studies in Bangladesh, Belarus, Brazil, Croatia, Nigeria, and Taiwan report that more mothers are initiating breastfeeding earlier and exclusively breastfeeding their infants longer in areas served by Baby-Friendly hospitals (*76*, 82, 120, 168, *210*, 225, 244).

For example, in Croatia between 1994 and 2000, after hospital staff received Baby-Friendly training, the average percentage of infants breastfed in these facilities rose from 30% to 66% at 3 months, from 11% to 49% at 6 months, and from 2% to 23% at 12 months (*29*). Similarly, in Bangladesh in 1997 and 1998 more mothers who delivered at a Baby-Friendly hospital in Dhaka exclusively breastfed their infants and breastfed more than twice as long as mothers who delivered in other Dhaka hospitals (5).

Community-Based Strategies Support Mothers' Success at Breastfeeding

Mothers who give birth in health facilities need continuing support to maintain breastfeeding once they return home (*48*). Mothers who give birth without a trained attendant rely even more on community information and support for breastfeeding, since they do not have the benefit of advice in a health facility. In developing countries about 6 births in every 10 are not attended by trained health care workers (251).

Community support—within a woman's home, in neighborhood facilities and programs, and at her workplace—leads to better breastfeeding practices. An effective community-based strategy for breastfeeding involves three key elements (*257*):

Taking Ten Steps to Successful Breastfeeding

QUICK LOOK

The Ten Steps to Successful Breastfeeding are the foundation of the WHO/UNICEF 1991 Baby-Friendly Hospital Initiative. They summarize the maternity care practices that support a woman's choice to breastfeed and enable women to breastfeed successfully. For a maternal health care facility to be considered Baby-Friendly, it should:

1. Have a written policy on breastfeeding that is routinely communicated to all health care staff.
2. Train all health care staff in skills necessary to implement this policy.
3. Inform all pregnant women about the benefits and management of breastfeeding.
4. Help mothers start breastfeeding within one hour of giving birth.
5. Show mothers how to breastfeed and maintain lactation, even if they are separated from their infants for a time.
6. Give newborn infants no food or drink other than breastmilk, unless medically indicated.
7. Practice rooming-in—that is, allow mothers and infants to remain together 24 hours a day.
8. Encourage breastfeeding on demand.
9. Give no artificial teats or pacifiers (also called dummies or soothers) to breastfeeding infants.
10. Foster the establishment of breastfeeding support groups and refer new mothers to them on discharge from the hospital or clinic.

To become a Baby-Friendly facility, staff first identify and correct practices that hinder breastfeeding. The facility is then assessed by a WHO/UNICEF trained evaluator to see if it has met international standards for maternity care and can thus achieve Baby-Friendly Hospital status.

In areas of high HIV prevalence, training and assessment criteria can include elements related to HIV. These elements help facilities to develop policies and procedures concerning HIV and to train staff on HIV and infant feeding, HIV testing and counseling, and preventing mother-to-child transmission of HIV.

WHO and UNICEF are revising and updating guidance for Baby-Friendly Hospital activities. The new guidance is expected some time in 2006.

Sources: WHO 1990 (270) and UNICEF 2004 (*235*)

Extending health care services into communities. After a new mother leaves a health care facility, providers should follow up to provide accurate information and continuing support and to manage or refer any health problems that arise. If misinformed, many women give their infants supplemental foods and liquids too early, rather than continuing exclusive breastfeeding.

Community health workers can reassure women that they are breastfeeding correctly and in a way that is effectively nurturing the infant and is frequent enough to maintain their milk supply (166). Several developing countries have included breastfeeding support in their postpartum follow-up strategies. Women may visit maternal and child health clinics, or health care providers may visit women's homes (82).

Programs in many countries report that extending health services into communities helps more women breastfeed exclusively and longer (17, 82, 87, 160, *185*, 239). An analysis of 20 studies from 10 countries—Bangladesh, Brazil, Iran, Mexico, Nigeria, and 5 developed countries—found that levels and durations of both exclusive and any breastfeeding increased significantly where professional or community health care workers offered women support in their homes for breastfeeding (*210*). On average, the more often a counselor has contact with a mother outside the clinic, the longer the mother maintains exclusive breastfeeding (*154*).

Counseling by lay counselors (community members trained in breastfeeding counseling), peer counselors (women in the community with children), or mother-to-mother (by women with children who have themselves successfully breastfed) all can be effective ways to provide support (*257*). Women's support groups or mother-to-mother groups also help mothers (82).

In Croatia in 1999–2000, for example, Baby-Friendly health facilities established breastfeeding support groups in communities. After discharge from the facility, mothers joined a community group that met every four weeks. Between meetings, members also could consult with the group leader. A visiting nurse helped to set up the group and to coordinate and supervise activities. After this phase of the program, the percentage of children who were breastfed increased at all ages between 1 and 12 months (*29*).

Also, in rural Ghana between 1993 and 1996, a self-managed credit association combined weekly meetings with health-education sessions. The sessions offered information on the benefits of exclusive breastfeeding and of giving colostrum to infants. Evaluation found that the proportion of mothers in the program group who gave colostrum to their newborns was more than twice that in a comparison group. Also, mothers in the program group introduced water into their infants' diets much later (82, 151).

Building support in the household and community. Breastfeeding strategies should address not only mothers but also the people who influence mothers—their mothers, spouses, other family members, friends, and community leaders. The advice and opinions of family and friends influence many women in their breastfeeding practices (83, 100).

A woman may not follow the advice of her health care provider if influential family members disagree. For instance, in Jos, Nigeria, nursing mothers cited family pressure—from either the mother or mother-in-law—as the main reason for giving water to their infants in the first six months, rather than breastfeeding exclusively, as health care providers recommend (166).

National media campaigns can encourage community support for mothers who breastfeed (80, 82, 90, 142). Campaigns work best when developed in collaboration with the community they are meant to reach. For example, from 1998 to 2002 in Haryana, India, community members helped to identify and develop solutions to common problems that breastfeeding women faced. Their observations helped shape broadcast messages that encouraged good breastfeeding practices. Evaluation of the program found that 31% of newborns received liquids other than colostrum in the program area compared with 75% in a comparison area. Also, at three months postpartum, rates of exclusive breastfeeding were substantially higher in the program area—79% compared with 48% (23, *257*).

Supportive spouses. Husbands' preferences influence their wives' breastfeeding practices, too. For example, in Hong Kong nearly 80% of mothers agreed that their husbands' encouragement and support for breastfeeding was important. Of women whose husbands approved of breastfeeding, 70% breastfed. Of women whose husbands preferred artificial feeding, 36% breastfed (118).

Involving husbands in community breastfeeding support groups also can encourage breastfeeding. In Istanbul, Turkey, in 1997 a community-based program increased men's knowledge of breastfeeding and improved their attitudes more than a previous clinic-based program had. Before attending the community meetings, about 50% of men said a father's support for breastfeeding was important, while 10% said giving birth in a Baby-Friendly hospital was important. After the meetings these percentages rose to more than 80% and 50%, respectively (230).

National Policies, Laws, and Partnerships Support Breastfeeding

Many governments have taken steps to support breastfeeding. They have enacted legislation and adopted policies and standards that help breastfeeding mothers in the workplace and that limit the marketing of breastmilk substitutes. In other countries, however, support for breastfeeding has weakened in the face of misunderstandings and challenges posed by the AIDS crisis. Especially in these countries, the UN has called upon governments to renew their commitment to breastfeeding as a key public health measure to improve infant health and survival.

Government efforts have improved hospital breastfeeding policies. For example, in the late 1980s the Kenyan Ministry of Health began a breastfeeding training and promotion program and instructed hospitals to stop routinely feeding newborns other fluids before their mothers' colostrum. After the policy changes, the percentage of health care providers who did so dropped from 93% to 48% (30). In Bolivia, Ghana, and Madagascar, levels of breastfeeding have risen in response to new policies combined with reform of practices in health care facilities and community support (*185*) (see Spotlight, opposite page).

Supporting breastfeeding mothers in the workplace. Around the world, studies find that women who resume full-time employment when their infants are young are less likely to continue exclusive breastfeeding and tend to breastfeed for fewer months (57, 140, 172, 277). Women often say that it is difficult or impossible to continue breastfeeding, particularly exclusive breastfeeding, while at work (*188*). In Guatemala City women who were not employed were 3.2 times more likely to breastfeed exclusively than women with jobs (56).

Breastfeeding is the right of every woman worker (55), but many employers do not want to bear the short-term cost of providing benefits to nursing mothers. They overlook the long-term savings in avoiding employee absenteeism (137). For one thing, because breastfed infants experience fewer and less severe illnesses, employed women who have breastfed their children have fewer absences from work to care for sick children.

As more and more women take jobs, breastfeeding in the workplace is becoming an important issue. Governments can promote public health and women's status by encouraging businesses to improve conditions for breastfeeding in the workplace. They can urge employers to allow women employees breastfeeding breaks without loss of wages and to provide clean and safe spaces in the workplace for women to express and store breastmilk (*188*). Governments also can negotiate with businesses to see that they provide women with long enough maternity leave to breastfeed optimally and that they offer medical benefits that include antenatal and postnatal care.

Limiting commercial formula marketing. Government policies can help protect mothers and health care providers from misleading promotions by commercial manufacturers of breastmilk substitutes. Breastmilk

SPOTLIGHT

Madagascar's Comprehensive Approach Improves Breastfeeding

As part of Madagascar's breastfeeding program, health care workers practice breastfeeding counseling using counseling cards, flipcharts, and posters. Here, a midwife role-plays with a traditional birth attendant to show how a mother correctly holds and latches her infant.
Photo: © 2001 Lisa Folda, Courtesy of Photoshare

In 1997 the Madagascar Ministry of Health launched a major program to improve breastfeeding practices. The program's approach can serve as a model for other countries. It combines policy-level approaches with improved health care services and community support. Health teams from the Ministry of Health, two USAID-funded projects with expertise in breastfeeding promotion—the LINKAGES Project and the Jereo Salama Isika (Look, We Are Healthy) Project—as well as other local and national organizations within Madagascar collaborated to carry out the program.

Policies and Partnerships Developed

During the first two years of the program, the national government developed policies on breastfeeding and infant nutrition. They also set up and coordinated a nationwide nutrition coalition of about 50 organizations. The organizations in this coalition agreed on nutrition guidelines, breastfeeding messages, communication materials, and behavior-change efforts to support better infant nutrition.

The government program promoted breastfeeding by focusing on essential actions for good infant nutrition: exclusive breastfeeding for the first six months, breastfeeding to complement other foods at six months and beyond, feeding sick children, improving women's nutrition, and managing vitamin A deficiency, anemia, and iodine deficiency.

Health Care Services Strengthen Support

The Ministry of Health promoted the essentials of good nutrition at clients' key points of contact with-in the health care system. These points included consultations for antenatal, delivery, and immediate postpartum care, as well as for family planning, immunization, growth monitoring, and treatment of children's illnesses. To provide services at these contact points, health care workers, community volunteers, and members of women's groups were trained in counseling and supporting mothers' infant feeding practices. Health care workers and community members practiced using communication materials such as counseling cards, flipcharts, and posters through role playing.

Community Approaches Inform and Encourage

A combination of community activities sought to influence breastfeeding practices. They addressed both mothers and their families. During postnatal follow-up in health facilities and women's homes, health care workers and community volunteers encouraged and helped mothers to try optimal breastfeeding practices.

Nutrition promoters also encouraged mothers to consider optimal breastfeeding practices and showed how family members can support mothers' decisions. Radio and television spots, traditional and popular singers, and village theater portrayed optimal breastfeeding behavior and conveyed the importance of family support.

Positive Results: More and Better Breastfeeding

The program reached more than 6 million people in rural and urban communities in two highland provinces. In 2000, 68% of children under six months old in the program area were being exclusively breastfed compared with 46% before the program began. In 2001 this percentage rose to a peak of 83%. In 2002 it fell to 75% after a political crisis put a temporary stop to the program's field activities.

More infants were exclusively breastfeeding into the fourth and fifth months after the program than beforehand. Among infants four and five months old, levels of exclusive breastfeeding rose from 12% before the program to 58% in 2002. Also, the percentage of infants beginning breastfeeding soon after birth rose from 34% before the program to 73% in 2000 and increased further to 76% in 2002.

Sources: Quinn 2005 (*185*) and WHO 2003 (*257*)

substitutes should not be promoted as an alternative to breastfeeding in general. Rather, they should be marketed for use with children over six months of age as a complement to breastmilk, or as an option for HIV-positive women who choose not to breastfeed (*253*).

The International Code of Marketing of Breastmilk Substitutes, which was adopted by the World Health Assembly in 1981 and has been strengthened over the years, is a worldwide effort to control international and local company marketing activities (223, 252). The code forbids manufacturers of breastmilk substitutes from providing free samples of their products, offering medical advice, or giving financial or material inducements to mothers and health care facilities to use their products. It also forbids manufacturers from marketing to the general public, particularly using words and pictures that idealize bottle feeding. The code applies to artificial milk for babies, feeding bottles, and other products used to feed babies such as teats (artificial nipples), especially when they are marketed for babies less than six months of age (252).

The code can restrict these marketing activities only if governments enact legislation or other policies that put it into practice. As of December 2004, 27 countries had approved laws implementing the entire code, and 55 countries had some provisions of the code in place (45). Worldwide, however, widespread violations of the code have been reported ever since it was introduced (3, 221).

Renewing support for breastfeeding in the era of AIDS. Government support for breastfeeding appears to have dropped off in some of the countries most affected by HIV/AIDS, according to a 2000 review of efforts in Botswana, Kenya, Namibia, and Uganda (*129*). This decline in support reflects a widely held but incorrect view that all HIV-positive mothers will infect their infants through breastfeeding. Also, the 2000 review reports that many people—including some Ministry of Health officials, health care providers, UN staff, and community leaders—have overlooked the life-saving and nutritional benefits of breastfeeding for all babies (*129*).

To address misunderstandings about HIV and breastfeeding, eight UN agencies together have developed the HIV and Infant Feeding Framework for Priority Action. The UN recommends that governments take a number of "priority actions" that address issues of exclusive breastfeeding and replacement feeding in HIV-affected areas. Their goal is to encourage appropriate feeding practices for all infants while doing more to reduce HIV transmission. To achieve this goal, people within different branches of the health infrastructure must coordinate to develop effective breastfeeding strategies (*260*).

Among other recommendations, the UN framework encourages governments to enforce the International Code of Marketing of Breastmilk Substitutes. According to WHO and the UN, mothers who are HIV-negative or do not know whether they are infected should avoid using breastmilk substitutes until their infants are six months of age (*260*). Private companies, however, promote breastmilk substitutes heavily in areas of high HIV prevalence. Such promotion can influence mothers who are not HIV-positive and for whom breastfeeding is often the only safe feeding choice, given the poor living conditions in most areas affected by the HIV/AIDS epidemic. Aggressive and misleading promotion of commercial formula could discourage women who would otherwise breastfeed (*119*).

Another recommendation in the UN framework is to provide adequate support to HIV-positive women so they can make an informed infant feeding decision and successfully carry it out (*260*). Providers can learn the facts about HIV and breastfeeding so that they are able to counsel women accurately. Also, mass-media campaigns and educational materials can reach community members and help decrease the stigma surrounding HIV infection, so that a woman with HIV does not feel obliged to breastfeed for fear that community members will assume that she is HIV-positive if she does not breastfeed (*119*).

Ensuring breastfeeding in crisis situations. The protection that breastfeeding can provide against disease is particularly important in crisis situations—when conflicts or natural disasters disrupt communities and displace large numbers of people. Often, donors supply breastmilk substitutes as part of emergency relief, but this well-intentioned practice causes more harm than good. For example, in Guinea-Bissau during the first three months of the 1998 war, weaned children were six times more likely to die than breastfed children (*101*).

UNICEF recommends that in crisis situations governments refuse donations of unnecessary replacement food (*199*). Instead, providing better maternal health care, more food rations, and an adequate supply of clean drinking water for pregnant and nursing women is a healthier and safer alternative. It is important that women receive additional food during both pregnancy and lactation (135, 234, *253*). Lactating women need extra calories, protein, and other nutrients. Without enough calories and nutrients they continue producing enough breastmilk for their babies but at the expense of their own energy and nutrient reserves.

Also, the heightened stress caused by a crisis situation can temporarily interfere with a mother's flow of breastmilk. If this stress continues, breastmilk production will decrease because the mother is not emptying her breasts. Eventually, she will stop producing breastmilk. WHO and UNICEF urge that relief efforts pay immediate attention to pregnant and breastfeeding women and offer safe havens where they will feel more secure, can remain with their infants, and will receive adequate food and support to breastfeed (*264*).

Breastfeeding Increases Women's Contraceptive Options

LAM has three criteria, all of which must be met if breastfeeding is to provide effective temporary protection from another pregnancy:

1. **The mother's menstrual periods have not returned, AND**
2. **The baby is fully or nearly fully breastfed, and frequently, day and night, AND**
3. **The baby is less than six months old. (For a discussion, see "Understanding the LAM Criteria," below.)**

When a woman meets all three of these criteria, her risk of pregnancy is less than 2% (112–114, *128*, 176, 186, *241*, 273). That is, among 100 women using LAM for six months, 1 or 2 would be expected to become pregnant.

After LAM no longer applies, or whenever a nursing mother wishes, she may change to another method of contraception to continue avoiding pregnancy. Various family planning methods provide effective protection from pregnancy and do not affect breastmilk production. A nursing mother can choose from several hormonal and nonhormonal methods, depending on how much time has passed since childbirth.

Who Can Use LAM?

Almost all nursing women can safely and effectively rely on LAM, including adolescents and women over age 40 (*265*). Health conditions that prevent some women from using other contraceptive methods do not prevent them from using LAM.

The majority of medications are safe while breastfeeding. Women taking a certain few medications should not breastfeed, however, and thus cannot practice LAM. A small amount of whatever a mother ingests is passed to the baby while breastfeeding (170). Medications that breastfeeding mothers should avoid because they would be risky for the baby are mood-altering drugs, certain anticoagulants, high doses of corticosteroids, and a few others (for a complete list see the Breastfeeding and Maternal Medication Recommendations for Drugs in the Eleventh WHO Model List of Essential Drugs <http://www.who.int/child-adolescent-health/New_Publications/NUTRITION/BF_Maternal_Medication.pdf>) (268).

Maternal care providers and family planning providers can inform and counsel women about breastfeeding, LAM, family planning, and birth spacing. Maternal care providers can counsel women during antenatal visits, immediately postpartum, and during follow-up care in the first weeks and months after childbirth—such as during immunization and growth monitoring visits. Family planning providers can counsel women who intend to become pregnant when the women visit clinics for such services as IUD or contraceptive implant removal, as well as when mothers seek family planning while breastfeeding. Both family planning providers and maternal care providers can advise women on the triple value of optimal breastfeeding—for their child's health, for their own health, and for temporary contraception.

Women who use LAM to delay their next pregnancy generally want another form of contraception after LAM in order to continue their protection from pregnancy.

Providers can use a simple checklist to determine whether a woman meets the three criteria necessary to use LAM (see box, page 14). Providers can help women understand how best to practice LAM, starting as soon as possible after giving birth, and breastfeeding properly. Providers also can help women plan for a transition from LAM to another contraceptive method when they no longer meet the LAM criteria, or if they no longer want to rely on LAM for contraception.

In addition to offering advice about preventing pregnancy, health care providers can and should counsel women about how to protect themselves from HIV/AIDS and other sexually transmitted infections (STIs). Of all contraceptive methods, only condoms, used consistently and correctly, help protect against HIV/AIDS and other STIs.

Understanding the LAM Criteria

Many women incorrectly believe that any breastfeeding protects them from becoming pregnant (*27*, 95). In fact, only breastfeeding according to the three LAM criteria provides reliable contraception. Health care providers can help breastfeeding women avoid unintended pregnancies by counseling them about the three LAM criteria, their importance, and the reasons for them:

1. The mother's menstrual periods have not returned. Following childbirth and while breastfeeding, a woman is

(continued on page 14)

Breastfeeding Is Best

Breastfeeding is the healthiest and safest way to feed most babies. Breastmilk is complete in its nutritional composition. Breastmilk contains a combination of fats, proteins, carbohydrates, other nutrients, and growth factors essential to fully satisfying the nutritional needs of infants and children (159, *162*).

Breastfeeding Saves Infants Lives

Babies who are breastfed have a lower risk of death both in infancy (under age one) and in early childhood (ages one to five) (*15*, 43, 152, 216, 255).

For instance:

- An analysis of survey data from 17 countries in Africa, Southeast Asia, and Latin America found that infants who stopped breastfeeding before two months of age were four times more likely to die before reaching four months of age than infants who continued to breastfeed through two to three months of age, after accounting for other factors that affect infant mortality (*195*).
- A study in Bangladesh found that infants who received partial or no breastfeeding were more than twice as likely to die before age one than infants who were exclusively breastfed for the first four months of life (*11*).

Breastfeeding and Breastmilk Promote Healthy Growth and Development

The nutrients in breastmilk promote a child's growth and development better than any substitute. The composition of breastmilk enables babies easily to digest the nutrients they need. Exclusive breastfeeding for up to six months as well as longer durations of any breastfeeding appear to promote greater gains in weight during infancy and greater gains in height as the child develops thereafter (12, 73, 121, 169, 179, 215, 246).

Breastfeeding also may have a small protective effect against childhood obesity and other cardiac risk factors (*9*, 13, 85, 130, 171, 211, 212). This protective effect may be due to a lower protein intake and energy metabolism among breastfed babies than among formula-fed babies (*9*, 117).

Several recent studies have found better cognitive development among breastfed children (7, 92, 155, 163). The more months of breastfeeding, the greater the gains in cognitive development (7, 8, 79, 163, 184).

Breastfeeding can help strengthen the emotional bond between mothers and their children, through closeness and connectedness (64, 144). This mother-child bonding may help to encourage women to breastfeed for more months, extending the health benefits (31, 243).

Breastfeeding Protects Against Certain Infectious Diseases

Both direct and indirect immunological benefits of breastfeeding help protect against the two most common types of childhood diseases—diarrhea and acute respiratory infection—as well as against middle-ear infections. An HIV-positive woman, however, can pass HIV to her baby through breastfeeding (see p. 17).

Diarrheal diseases. Breastfeeding, especially exclusive or full breastfeeding, significantly reduces the likelihood of diarrheal disease (4, 120, *138*, 139, 197, 247) (see Figure 1). Breastfeeding protects against diarrheal diseases in two ways:

1. By reducing a baby's exposure to potentially contaminated drinking water (exclusive breastfeeding eliminates exposure altogether). Contaminated water is the leading source of diarrheal disease in many countries (89, 180, 242).
2. By helping the infant's own immune system to develop and protect against pathogens. Growth factors in breastmilk promote the growth of essential bacteria that prevent the growth of gastrointestinal pathogens. Anti-infective agents in breastmilk, such as antibodies and macrophages, actively inhibit or destroy pathogens (88, 127, *162*).

Acute respiratory infection and pneumonia. Acute respiratory infection is a leading cause of death in children under age five in developing countries. Pneumonia is the most serious respiratory infection. It causes 9 deaths in every 10 from acute respiratory infection among children under age five (267).

Breastfed children, especially those exclusively breastfed, have a lower risk of pneumonia than other children (*14*, 34, 66, 70, 175, 245, 247, 274). For example, in Brazil infants who were partially breastfed and those who were not breastfed had a risk

A nurse weighs an infant at a Rotary International Child Spacing and Family Health Center in Nigeria. The nutrients in breastmilk promote child growth and development better than any substitute. Exclusive breastfeeding for up to six months especially promotes greater gains in weight during infancy. Photo: © 2000 Liz Gilbert/David and Lucile Packard Foundation, Courtesy of Photoshare

of developing pneumonia that was, respectively, 3.8 and 16.7 times higher than that for infants who were exclusively breastfed (39).

Middle-ear infections. Breastfeeding reduces the occurrence of middle-ear infections in children (62, 72, 197, 232). For example, a study in Mozambique found that children who had been breastfed for more than 18 months had one-fifth the risk of middle-ear infection that children breastfed for 6 months or less had (52). Middle-ear infections can lead to hearing impairment and thus to delayed speech development (21, 222).

Breastfeeding May Protect Against Chronic Diseases

Breastfeeding may help lower susceptibility to later chronic diseases such as diabetes and asthma. Some studies have found that breastfeeding is associated with a reduced risk of childhood onset of diabetes mellitus (84, 109, 145, 161, 196). The early introduction of breastmilk substitutes, such as cow's milk, into an infant's diet may increase the risk of childhood onset diabetes mellitus (78, 161, 177).

There is some evidence that breastfeeding helps protect against asthma (192), although not all studies find such a relationship (200). One study found that children who had ever breastfeed had reduced their risk of having asthma by almost 60% compared with children who had never breastfed (86). In particular, exclusive breastfeeding during the first months after birth has been associated with lower asthma rates during childhood (77, 164).

Breastfeeding appears to reduce the occurrence of some childhood cancers (97, *141*, 208, 233). Longer durations of breastfeeding may provide more protection against childhood leukemia and lymphomas than shorter durations (53, 178, 208, 214). For example, one study found that the risk of leukemia and lymphomas was more than 2.5 times greater among children who had breastfed for six months or less compared with children who had breastfed longer than six months (20).

Health Benefits for Breastfeeding Women

Breastfeeding has direct health benefits for mothers—as soon as they begin to breastfeed, throughout breastfeeding, and for the rest of their lives.

Postpartum benefits. Breastfeeding early, ideally as soon as possible after childbirth, can help to expel the placenta, reduce blood loss, and speed uterine involution—the process by which the uterus returns to its normal size. These benefits occur because oxytocin, a hormone released in the body when a woman breastfeeds, stimulates uterine contractions (10, 205). The contractions help to expel the placenta and decrease postpartum blood loss (198). Breastfeeding also may help a woman's body weight to return to normal postpartum (58–60, 102, 111), although study findings on weight loss are mixed.

Reducing cancer risks. Breastfeeding reduces the risk of both epithelial ovarian cancer (158, 189, 190, *229*, 275) and breast cancer (19, 126, 228, 279). One large study found a reduced risk of breast cancer averaging 14% among women who ever breastfed compared with women who never breastfed (*22*). Among premenopausal women, the longer the total duration of breastfeeding over a lifetime, the more protection that breastfeeding appears to provide (*22*, 131, 158, *229*, 279).

Bone health. Breastfeeding may be associated with better bone health later in life. Some studies report greater bone density among women who have ever breastfed compared with women who have not breastfed (41, 148, 174). Two studies have reported lower risk of hip fracture later in life in women who have breastfed for longer durations (51, 123). While studies consistently find a temporary bone loss during breastfeeding, this loss is fully recovered after weaning or once menses resume (40, 91, 181, 278).

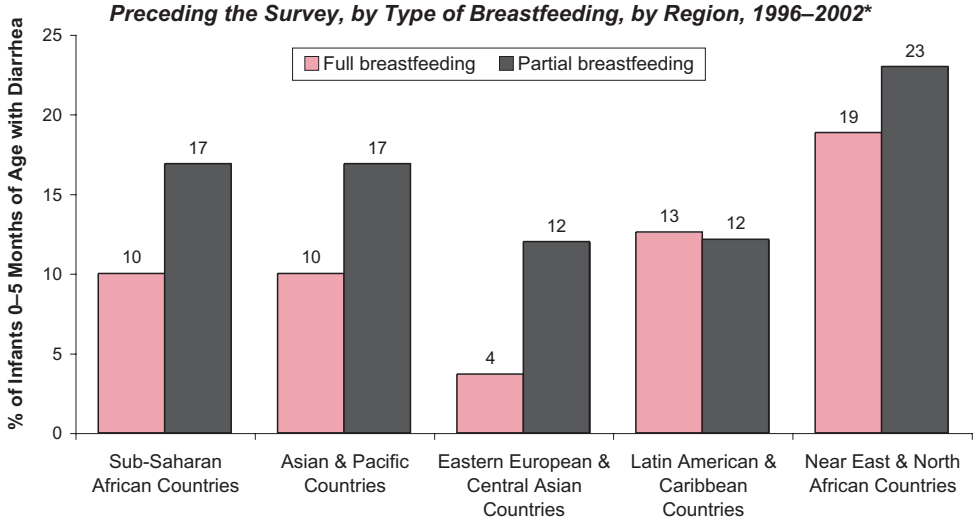
Breastfeeding Saves Money

Breastfeeding offers savings both for families and for societies. Formula feeding is unaffordable for most families in the developing world (2, 149). Women who breastfeed save the cost of buying formula as well as supplies such as bottles and teats and equipment for sterilization and refrigeration (69, 182).

As noted, breastfed children experience fewer and less severe illnesses than children who are formula-fed (153, 231). Thus breastfed children require less health care—another savings both for families and for the health care system (*15*, 16, 28, 134, 182).

Figure 1. Better Breastfeeding Reduces Diarrhea

Percentage of Infants 0–5 Months of Age with Diarrhea in the Two Weeks Preceding the Survey, by Type of Breastfeeding, by Region, 1996–2002*



*Percentages are regional medians. Data come from 27 sub-Saharan Afican countries, 7 Asian & Pacific countries, 5 Eastern European & Central Asian countries, 8 Latin American & Caribbean countries, and 4 Near East & North African countries.

Source: Stallings, 2004 (217)

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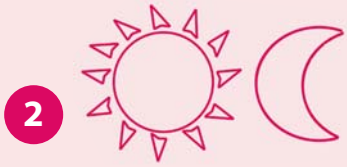
When Can a Woman Use LAM?

A breastfeeding woman can use LAM to space her next birth and as a transition to another contraceptive method. She may start LAM at any time if she meets all three criteria required for using the method.

Ask the mother, or urge her to ask herself, these three questions:

1 **Have your menses returned?**



2 **Are you regularly giving the baby other food besides breastmilk or allowing long periods without breastfeeding, either day or night?**

3 **Is your baby more than 6 months old?**

If the answer to ALL of these questions is NO…

…she can use LAM. There is only a 2% chance of pregnancy at this time. A woman may choose another family planning method at any time—but preferably not a method with estrogen if her baby is less than six months old. Methods with estrogen include combined oral contraceptives and combined injectables.

Source: Adapted from Institute of Reproductive Health 1992 (98)

But, when the answer to any ONE of these questions is YES…

…her chances of pregnancy increase. Advise her to begin using another family planning method, preferably one without estrogen, and to continue breastfeeding for the child's health.

Illustration: Rafael Avila/JHU CCP

less likely to ovulate and menstruate. The return of a woman's menses is an important indicator that her postpartum infertility is at an end. It indicates that ovulation has resumed or may soon resume. During the first eight weeks after childbirth, women may experience light bleeding or spotting, but this is not menstrual bleeding. Light bleeding during this time would not prevent a woman from practicing LAM. But if a woman perceives that her menses have returned, or if she has two consecutive days of bleeding, then she can no longer safely rely on LAM for contraception.

2. The baby is fully or nearly fully breastfed, and frequently, day and night. The effectiveness of LAM depends on a pattern of breastfeeding that is full or nearly full breastfeeding and is frequent. Full breastfeeding in this context refers both to exclusive breastfeeding (when the infant receives no other liquid or solid) and to almost-exclusive breastfeeding (when the infant receives vitamins, water, juice, or other nutrients infrequently in addition to breastmilk). Nearly full breastfeeding means that the majority of feedings (more than three-fourths) are breastfeeds.

Women should aim for exclusive breastfeeding and avoid giving their babies regular supplementation. Infants who are fully or nearly fully breastfed suckle the most. Frequent suckling is crucial because the effectiveness of LAM depends on a baby's suckling. As long as additional foods do not decrease the frequency and amount of breastfeeding—and thus suckling—by much, small amounts of supplementation do not lessen the effectiveness of LAM.

Active suckling brings about the biological actions necessary to suppress ovulation. A baby's suckling stimulates the nipple, which gives a signal to the mother's hypothalamus—the region of the brain that secretes hormones. The hypothalamus then releases the hormone prolactin, which stimulates milk production. Prolactin also blocks the release of the gonadotropin-releasing hormone (GnRH),

which is one of the hormones that promotes ovulation (146, 220). When the baby's suckling falls below a certain frequency and intensity, GnRH and other hormones that promote ovulation are no longer blocked, and menstrual cycles—and thus fertility—soon resume (147).

Frequent breastfeeding helps mothers obtain the full contraceptive benefits of LAM as well as being key to optimal breastfeeding. An ideal pattern varies with the age of the child—between 10 to 12 feedings a day in the first few weeks after childbirth and thereafter between 8 to 10 times a day or on demand (whenever the baby wants to be fed), including at least once at night in the first months. Breastfeeding sessions during the day should be no longer than four hours apart and at night no longer than six hours apart. Some babies may not want to breastfeed 8 to 10 times a day and may want to sleep through the night. These babies may need gentle encouragement to breastfeed more frequently.

3. The baby is less than six months old. A woman can begin LAM anytime during the first six months after childbirth, as long as she has been fully or nearly fully breastfeeding her baby since birth and her menstrual periods have not returned. This is especially important if she wants to start LAM more than two months after childbirth. After six months of age, when a child starts to get other food, suckling diminishes, and ovulation eventually resumes.

An estimated 10% to 40% of women using LAM resume menstruating before six months postpartum (*241*). The probability that a woman's menses will return before six months depends on many factors. For instance, menses are likely to return later in women with many children and women who are underweight (*272*). For some women, LAM can continue to be effective beyond six months if the mother's menses have not returned, and if she can continue to breastfeed frequently and can breastfeed before giving the infant other foods at each meal (47, 207).

Can Employed Women Use LAM?

Women who are able to keep their infants with them at the work site or nearby and are able to breastfeed frequently can rely on LAM as long as they meet the three criteria for LAM. Women who are separated from their infants by work or for other reasons can use LAM if the separation is less than four to five hours at a time.

Pregnancy rates may be higher for women who are separated from their infants, however. The one study that assessed use of LAM among working women estimated a risk of pregnancy of 5% during the first six months postpartum (*238*). In this study each woman was asked to express her breastmilk while away from her infant—at least as often as the feeding pattern at home and never less than every four hours. Expressing breastmilk may not signal the mother's hypothalamus to stimulate milk production as well as suckling does.

An employed woman may want to use LAM but worry that her job will prevent it. Health care providers can encourage the woman to breastfeed more often when she is with her baby. This may ensure enough suckling to maintain the contraceptive effectiveness of LAM (*238*). Providers also can advise the woman that full and frequent breastfeeding provides immediate health benefits for the infant whether or not she can practice LAM.

Making a Transition from LAM

Family planning providers can help women make a transition from LAM to another family planning method. Providers can help women make informed choices about other contraception while they still rely on LAM or whenever they want to change from LAM to another method.

Women who use LAM to delay their next pregnancy generally want another form of contraception after LAM in order to continue their protection from pregnancy. For example, in a 2004 study in Amman, Jordan, 41% of previous LAM users had made a transition to using an IUD, oral contraceptives, or condoms by 12 months postpartum. In contrast, 23% of women who breastfed but were not practicing LAM had adopted one of these methods (*27*).

Other Contraceptive Methods for Breastfeeding Women

A breastfeeding woman has other contraceptive options besides LAM. These include both nonhormonal and

Providers can inform and advise couples of several appropriate contraceptive options while a woman is breastfeeding. If a woman is using the lactational amenorrhea method (LAM), providers can help her avoid an unintended pregnancy by planning for a transition to another method long before the three LAM criteria no longer apply. Illustration: The LINKAGES Project/AED

hormonal methods. Her options depend on how much time has passed since childbirth (see Table 3).

Nonhormonal methods do not affect breastfeeding or breastmilk. Nonhormonal methods for breastfeeding women or their partners include condoms, spermicides, the diaphragm, copper IUDs, and some fertility awareness-based methods, as well as the permanent methods, female and male sterilization. Women can begin these methods almost immediately after childbirth, with the exception of the diaphragm and fertility awareness-based methods.

Experts recommend delaying use of the diaphragm until at least six weeks, when the woman's uterus has returned to normal size and the diaphragm can be fitted (*265*). Couples can learn to use fertility awareness-based methods, but, to practice them effectively, they should delay use until six weeks after childbirth or until menstruation resumes depending on the method. This delay is necessary because fertility-based methods either track the signs of fertility or monitor days in the cycle. The signs of fertility may be misleading if a woman is not having menstrual cycles (*265*).

Also, if the copper IUD is not inserted immediately after childbirth, insertion should be delayed until four weeks postpartum (*265*). IUD insertion within 48 hours after delivery is safe and convenient. There is a greater chance, however, that the IUD will be expelled as contractions return the uterus to normal size (226). Similarly, if tubal ligation is not performed within one week after childbirth, it should be delayed for six weeks, until the uterus has contracted (*265*). Tubal ligation is commonly performed soon after childbirth; IUD insertion immediately postpartum is less common. Both postpartum procedures require training in special techniques (44, 226).

Hormonal methods that contain only a progestin are appropriate as early as six weeks after childbirth. By that time breastfeeding is well established (*265*). Progestin-only contraceptives include certain oral contraceptives, injectables, vaginal rings, implants, and the LNG-IUD. Before six weeks small amounts of the hormone would be passed to the newborns, who cannot metabolize steroids at that age (18, 25, 61). When the hormones are taken at six weeks or later, the small amounts in breastmilk do not appear to harm an infant's growth or affect the quantity and quality of breastmilk (227).

Six months after childbirth, a breastfeeding woman also can safely use combined hormonal methods, which contain an estrogen as well as a progestin. These include combined oral contraceptives, combined injectables, the contraceptive patch, and combined vaginal rings. By six months, the effect that these methods might have on the quantity and quality of breastmilk, if any, is small (194). Use of these methods between six weeks and six months is usually not recommended unless other, more appropriate methods are not available or not acceptable (*265*).

Table 3. When Breastfeeding Mothers Can Begin a Family Planning Method After Childbirth, Compared with Mothers Not Breastfeeding

Family Planning Method	Breastfeeding	Not Breastfeeding
Lactational amenorrhea method (LAM)	Immediately	Not applicable
Vasectomy **Condoms** **Spermicide**	Immediately	Immediately
Copper IUD	Within 48 hours; otherwise delay 4 weeks	Within 48 hours; otherwise delay 4 weeks
LNG-IUD	Within 7 days; otherwise delay 6 weeks	Within 7 days; otherwise delay 6 weeks
Female sterilization	Delay 4 weeks	Delay 4 weeks
Fertility awareness-based methods*	Delay until menses return	Delay 4 weeks
Diaphragm	Delay 6 weeks	Delay 6 weeks
Progestin-only oral contraceptives **Progestin-only injectables** **Progestin-only vaginal rings** **Implants**	Delay 6 weeks	Immediately
Combined oral contraceptives **Combined injectables** **Contraceptive patch** **Combined vaginal rings**	Delay 6 months	Delay 3 weeks

*The Standard Days Method of fertility awareness-based family planning should be delayed until a woman's regular menstrual cycle resumes and she has had three postpartum menses. The traditional calendar rhythm method should be delayed until a woman's regular menstrual cycles resume and she has had six postpartum menses to gauge the length of her cycle.

Source: WHO 2004 (*265*)

Women with HIV Face Crucial Breastfeeding Decisions

A mother living with HIV faces a difficult decision—whether to breastfeed, in order to give her infant important nutrients and protection from potentially deadly diseases, or not to breastfeed, to avoid the risk of transmitting HIV through breastmilk.

From a public health perspective, preventing HIV transmission through breastfeeding is crucial. Transmission through breastfeeding is estimated to account for one-fourth to one-half of infant HIV infections, depending on the duration of breastfeeding (*54, 259*) (see Figure 2).

HIV also can be transmitted from an infected mother to her child during pregnancy or delivery. Among 100 children born to mothers with HIV who do not receive antiretroviral treatment, an estimated 15 to 25 children will become infected with HIV during gestation and delivery. If mothers with HIV breastfeed their infants up to six months of age, an additional 5 to 10 of these 100 children would become infected. If breastfeeding lasts between 18 and 24 months, 15 to 20 of these children would be infected through breastmilk (*259*).

On average, among babies born uninfected and who are breastfed by untreated mothers with HIV, 16% will become infected when breastfeeding continues for two years (*32, 54,* 63, *96, 105, 156*). Shorter and exclusive breastfeeding minimizes the risk (see p. 18). Studies are underway to assess whether treating mothers and their breastfeeding babies with antiretroviral therapy will reduce HIV transmission through breastmilk (see p. 22).

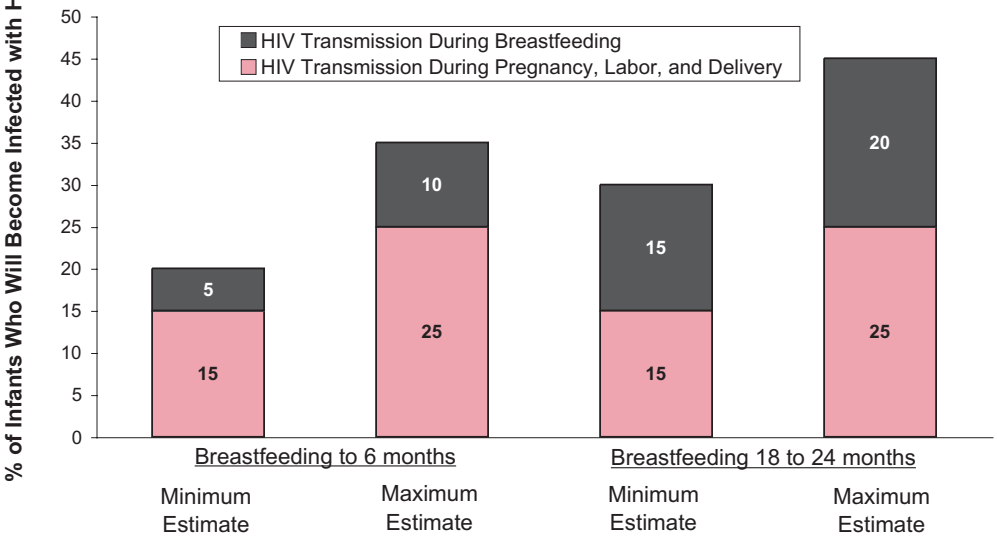
Balancing the Risks

Weighed against the risks of breastfeeding for infants of women with HIV are the risks and consequences of not breastfeeding. In developing countries diarrheal and respiratory diseases are common and often fatal to infants—and considerably more common and deadly for infants who are not breastfed than for those who are. Infants who do not breastfeed miss the early immunological protection conveyed by breastmilk, and they risk malnutrition and exposure to contaminated water. It is estimated that over half of deaths among young children can be attributed to malnutrition (38). Breastfeeding could prevent many of these deaths—especially exclusive breastfeeding, because it promotes greater gains in weight during infancy (pp. 12–13).

Women with HIV and their health care providers need to weigh the various risks and consequences in deciding whether to breastfeed and, if so, when to begin replacement feeding. Currently, infants cannot be reliably tested for HIV early enough to influence a mother's feeding decision. Instead, the weighing of risks and consequences often depends on the circumstances that a woman with HIV faces:

Figure 2. Estimated Risk of HIV Infection in Infants and Young Children

Minimum and Maximum Estimated Percentage of Infants Who Will Become Infected with HIV During Pregnancy, Labor, and Delivery and During Breastfeeding, by Length of Breastfeeding*



*Estimates are per 100 infants born to HIV-positive mothers who do not receive treatment.
**Breastfeeding transmission estimate at six months includes early breastfeeding transmission (during the first two months), which is difficult to distinguish from transmission during labor and delivery in published studies but likely accounts for more than half of HIV transmission in the first six months postpartum.
*Data are cumulative totals; that is, breastfeeding transmission estimates by 24 months include transmission occuring before 6 months.

Source: WHO 2003 (259)

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- Can she obtain safe replacement food for her infant? A mother or family must be able to afford replacement food and also have the utensils and skills to prepare it correctly and hygienically.
- Can she adequately care for her own health while nursing? It is important that women with HIV maintain adequate nutrition since HIV infection progresses more rapidly among women who are undernourished. Nursing mothers with HIV also must care for their breasts to prevent problems such as mastitis, which increase the chance that breastfeeding will pass HIV to their babies (see p. 20).
- Can she win the support of her family and community for replacement feeding instead of breastfeeding? In some places not breastfeeding amounts to acknowledging that you are infected with HIV and exposes women to the social stigma and censure that many HIV-infected people face.

In contrast, one issue that does not have to concern women with HIV is that breastfeeding does not harm their own health and does not place them at a higher risk of death while breastfeeding (*33, 49, 115, 125, 201*).

While safe and nutritious alternatives to breastmilk would eliminate the risk of HIV transmission, such alternatives often are unavailable, unaffordable, or culturally unacceptable (see p. 20). In areas with high infant and child mortality rates and without appropriate alternatives to breastmilk, not breastfeeding is more dangerous to the child of a woman with HIV than breastfeeding—particularly because

HIV transmission through breastfeeding can be reduced through exclusive and shorter breastfeeding.

most children breastfed by HIV-positive mothers do not become infected. A study that assessed the risks of different feeding strategies through a simulation model found that in areas of poverty and poor hygiene—such as much of sub-Saharan Africa—the risk of death associated with replacement feeding considerably exceeds the risk of HIV transmission (and death) associated with six months of breastfeeding (*191*). The study estimated that, compared with replacement feeding, any breastfeeding by HIV-infected mothers during the first six months would result in 68 HIV infections but 100 fewer deaths from other causes per 1,000 live births.

HIV Transmission Through Breastfeeding Can Be Reduced

The risk of HIV infection varies substantially depending on the pattern and duration of breastfeeding.

Shorter breastfeeding poses less risk. Even a few weeks or months of breastfeeding provides infants with nutrition and protection against illness. Women with HIV can breastfeed to provide these benefits and then stop breastfeeding early to reduce the chances of infecting their infants. The risk of HIV transmission is cumulative—that is, the longer the child is breastfed, the greater the chances of infection (32, *65*). Research findings are mixed, however, as to whether the risk in the first weeks of breastfeeding is higher than in later months (*32, 50,* 67, *96,* 132, 150, *156*).

Exclusive breastfeeding is less risky than mixed feeding. Introducing other food while still breastfeeding increases the likelihood of HIV transmission (*96*). A recent study in Zimbabwe, involving more than 4,000 HIV-positive mothers and their infants, found that exclusive breastfeeding in the first months of an infant's life is safer than early introduction of other food. Compared with infants who were exclusively breastfed for the first three months, infants who were mixed-fed were 4 times more likely to have acquired HIV at 6 months. Infants who were exclusively breastfeeding in the first months of life were better off later, too, when replacement food was given along with breastmilk. Compared to these babies, infants who were mixed-fed early were 3.8 times more likely to have acquired HIV at 12 months and 2.6 times more likely at 18 months (*96*). This study confirms earlier findings (*50*).

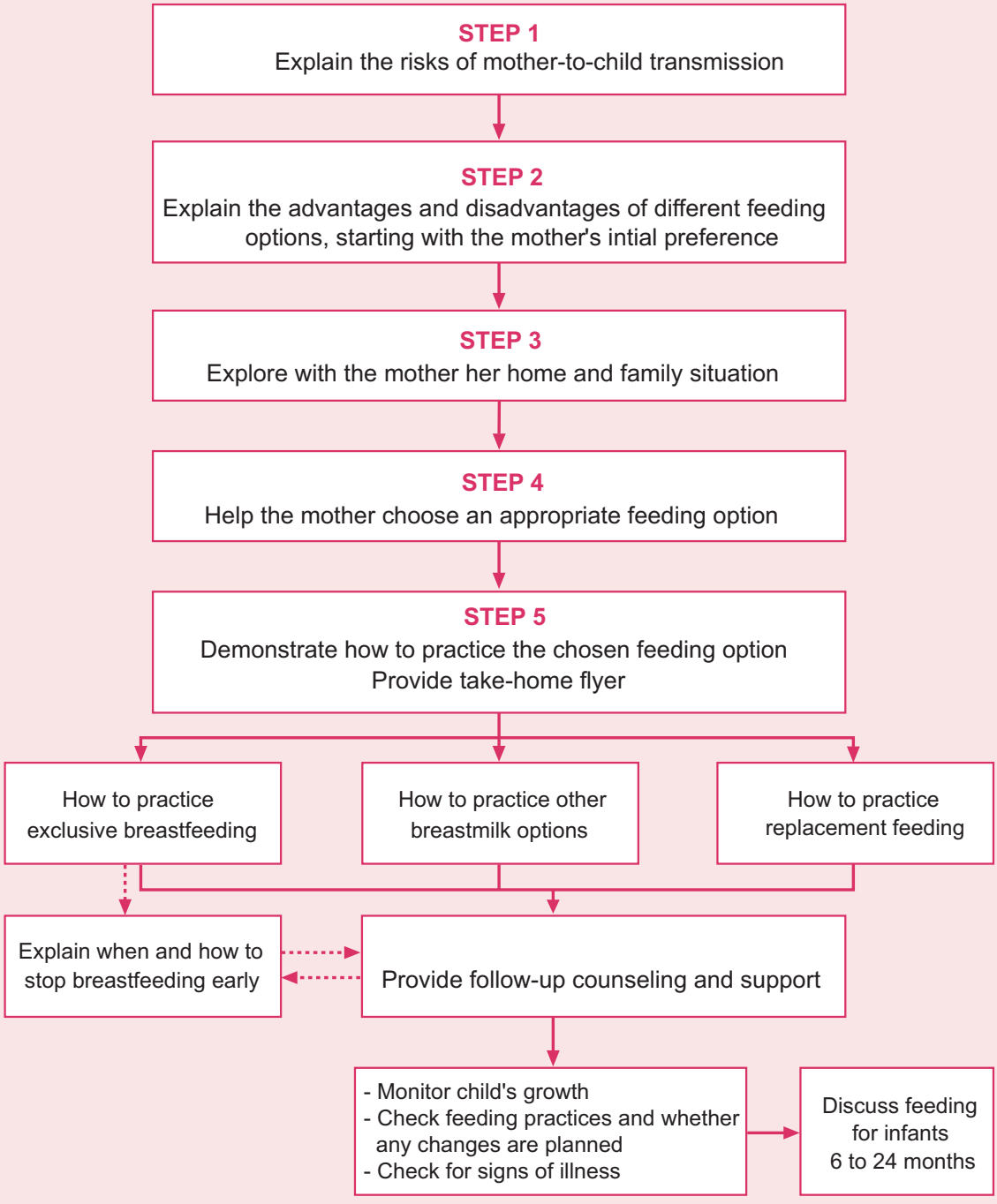
It is not clear why mixed feeding is less safe than exclusive breastfeeding. It is thought that other foods disturb the intestinal lining of infants in the first months of life, allowing HIV to pass more easily into the bloodstream (37, 213). In any case, the intestines of young infants are highly permeable, which enables them to absorb immunoglobulins and gain other passive immunity from breastmilk (116). Breastfeeding facilitates faster closure of the intestinal gaps, whereas foods other than breastmilk can inflame and damage intestinal cells (37, 249).

The Zimbabwe study also found that even predominant breastfeeding—that is, giving only liquids such as water, tea, or juice in addition to breastmilk—increased risk of HIV transmission. Compared with infants who were exclusively breastfed, infants who were predominately breastfed for the first three months of life were 2.6 times more likely to have acquired HIV by 12 months of age (*96*).

What Do Experts Advise?

WHO and other UN agencies advise that HIV-positive mothers avoid breastfeeding if replacement feeding meets five essential criteria—affordable, feasible, acceptable, sustainable, and safe (often referred to as the AFASS criteria, for the first letter of each of the criteria). Otherwise—and this would apply for the great majority in developing countries–HIV-positive mothers should breastfeed

HIV and Infant Feeding Counseling Flow Chart



This flow chart illustrates the counseling process that health care providers can follow to support HIV-positive mothers making decisions about feeding their infants. It is drawn from the HIV and infant feeding flipchart of counseling cards used during one-to-one sessions with pregnant women and mothers, one of four HIV and infant feeding counseling tools developed by UNICEF and WHO.

For more information on these tools and on adapting them for local use, contact the World Health Organization's Department of Child and Adolescent Health Development (CAH) by e-mail: <cah@who.int>, telephone: +41-22-791-32-81, or postal mail: 20 Avenue Appia, 1211 Geneva 27, Switzerland.
Source: WHO 2005 (271)

exclusively for their infants' first months of life and stop breastfeeding if replacement feeding can meet the five criteria or when breastmilk alone is no longer adequate (*259*). The greater risk of early mixed feeding means that infants of mothers with HIV need to stop breastfeeding all at once, rather than gradually, when they switch to replacement feeding.

Where replacement food for infants can meet the five essential criteria, as in much of the developed world, the decision is clear: Women should avoid breastfeeding if they have HIV and give only appropriate replacement foods. In much of the developing world, however, the decision is more difficult. Safe replacement feeding usually cannot be readily obtained. Most families cannot afford to purchase, prepare, or properly store commercial formula. Homemade breastmilk substitutes must be carefully measured and should be prepared and stored under sterile conditions, which is often difficult or impossible. Common traditional substitutes for breastmilk, such as rice water, do not provide enough nutrition. All of these factors make replacement feeding difficult or dangerous.

A study in Rakai, Uganda suggests that a woman's chances of acquiring HIV may be greater in pregnancy than at other times.

What Providers and Mothers Can Do

Ultimately, every HIV-positive mother's decision whether to breastfeed is her own individual decision. For their part, health care providers should take responsibility for making sure she has adequate accurate information to make that decision, and they should provide support for the decision that she makes. In particular, they can help women weigh the risks of breastfeeding and of replacement feeding.

WHO, UNICEF, and other international health organizations suggest a number of ways that providers can advise and encourage women with HIV to make informed decisions about breastfeeding and can counsel HIV-negative women or those who do not know their HIV status to avoid infection and seek testing (*119, 136,* 167, *259*). Their advice includes the following:

Avoid HIV infection. If a woman is HIV-negative or she does not know her HIV status, she needs to protect herself against HIV infection and, if at risk, she and her sexual partner should consistently use condoms. Recent research suggests that her chances of acquiring HIV may be greater in pregnancy than at other times. A large study in Rakai, Uganda, reports that pregnant women have a 2.3 times greater risk of acquiring HIV than women who are not pregnant and not breastfeeding and almost 1.8 times greater risk than breastfeeding women (81).

Avoiding HIV infection while breastfeeding is especially important for the sake of the infant's health. If a woman becomes infected with HIV in the time she is breastfeeding, the risk of transmitting HIV to her infant is more than twice the risk among women infected before giving birth (63, *65*, 240).

Get HIV testing and counseling. When women know their HIV-infection status and are counseled, they can make more informed decisions about infant feeding and about how to protect their own health. HIV transmission through breastmilk is more likely among mothers with higher levels of HIV in breastmilk (67, 104, 193, 202) or in maternal plasma (75, 132, 202). High levels of the virus typically occur when the immune system begins to fail. High levels also occur in primary HIV infection—the first phase of infection, when the virus replicates quickly before the immune system develops antibodies to respond (110). Unfortunately, the most widely available tests cannot detect HIV infection this early.

The strength of an HIV-infected person's immune system and the severity of the HIV infection are reflected in the CD4+ cell count, also referred to as the T4 cell count. The CD4+ cell count declines when the HIV virus is replicating quickly, signaling advanced disease. Thus mothers with lower CD4+ cell counts are at greater risk of transmitting the virus through breastfeeding (*32, 65, 96,* 132).

Many women are reluctant to get tested for HIV. Some fear being stigmatized and condemned by their community if their infection becomes known. Others feel that testing is pointless because they cannot obtain treatment or access to good reproductive health services. Improving the quality of treatment and counseling available to mothers with HIV can help overcome such reluctance (106). Providers can counsel women that knowing their HIV status is important to making informed decisions about their own health and about the health of their infants. Also, providers can encourage a woman to seek testing together with her spouse or partner as a way to overcome some of these barriers.

Maintain good health. Women with HIV and women of unknown HIV status who are nursing should pay extra care and attention to their breast health. Mastitis, breast abscess, and nipple lesions increase the risk of HIV transmission through breastfeeding (*65*, 67, 104, 202, *250*). To help avoid these problems, health care providers can give nursing mothers advice and support on positioning the baby and latching on and recommend frequent feeding

from both breasts. Caring for the infant's oral health is also important. Oral thrush (a fungal infection of the mouth) in infants appears to increase HIV transmission through breastfeeding (*65*). Providers can teach mothers to identify and seek treatment for breast problems or infant thrush.

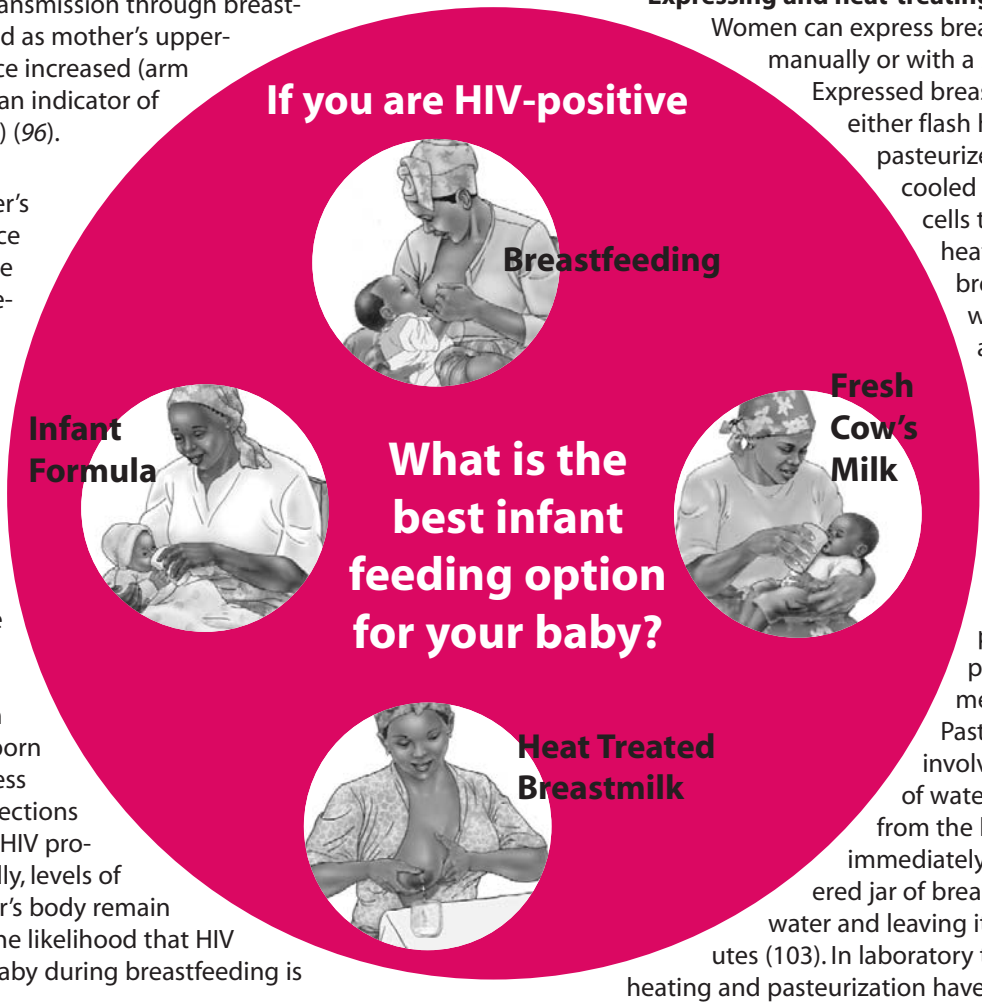
Health care providers can help women to maintain adequate nutrition. When women are well-nourished, HIV progresses less rapidly. For example, a study in Tanzania found that HIV progressed less rapidly among mothers given supplements of vitamins B, C, and E than among mothers who were given a placebo (*68*). In Zimbabwe, a study found that HIV transmission through breastfeeding decreased as mother's upper-arm circumference increased (arm circumference is an indicator of nutritional status) (*96*).

Improving mother's nutrition to reduce the rate of disease progression benefits both the mother and her infant. A study in Zambia found that HIV-free infants born to women with advanced HIV are 2.9 times more likely to die and 2.3 times more likely to be hospitalized than HIV-free infants born to women with less advanced HIV infections (*124*). Also, when HIV progresses less rapidly, levels of HIV in the mother's body remain lower, and thus the likelihood that HIV will pass to the baby during breastfeeding is less (32, *65*, 132).

Consider a range of infant feeding options. Counseling a woman on the healthiest choices for her situation and on replacement feeding methods can enable her to make informed decisions (*259*) (see flow chart, p. 19).

For women who breastfeed: If a woman with HIV decides to breastfeed her newborn, she has several options.

- **Exclusive breastfeeding.** Exclusive breastfeeding for the first months of life—and avoiding mixed feeding—is usually the best way to increase the safety of breastfeeding, while giving infants the ideal nutrition and immunologic protection provided by breastmilk. Exclusive breastfeeding is recommended for HIV-positive women when replacement feeding does not meet the five essential criteria. Breastfeeding should be stopped if and when all these criteria can be met or when exclusive breastfeeding is no longer nutritionally adequate. Stopping breastfeeding early is recommended so that the amount of time an infant is exposed to HIV transmission through breastfeeding is short. Also, mothers should stop breastfeeding all at once, rather than gradually, since mixed feeding poses greater risk.



- **Expressing and heat-treating breastmilk.** Women can express breastmilk either manually or with a breast pump. Expressed breastmilk can be either flash heated or else pasteurized and then cooled to kill HIV and the cells that carry it. Flash-heating is heating breastmilk in a water bath (that is, a double-boiler) until the water begins to boil, and then removing the milk from the water bath and heat source (42). A simple and inexpensive home pasteurization method, Pretoria Pasteurization, involves boiling a pan of water, removing it from the heat source, immediately placing a covered jar of breastmilk in the water and leaving it there for 20 minutes (103). In laboratory tests both flash heating and pasteurization have been shown to deactivate HIV (*99*). Heat treatment destroys some breastmilk components, but it is still better for infants than commercial formulas or animal milk.

- **Wet-nursing.** Allowing a family member or someone else to nurse the baby is acceptable in some cultures

A woman with HIV has several options for feeding her infant, each of which carries with it specific risks and benefits. With the help of a health care provider, an HIV-positive woman can make informed decisions about breastfeeding and choose the best option for her circumstance.
Illustration: Peggy Kooniz Booher, Kurt Mulholland, and Victor Nolasco/URC/QAP

when the infant's mother is too ill or does not have enough breastmilk (94, 276). Wet nurses may not be safe, however. Cases of HIV transmission from wet nurses with undiagnosed HIV infection have been reported (206). Wet-nursing should be considered only when the prospective wet nurse tests HIV-negative and remains so during the feeding period.

For women who can choose replacement feeding: If replacement feeding can meet the five essential criteria, a woman with HIV may decide to avoid breastfeeding altogether. In this case she can consider several options, each of which has specific risks and benefits:

- **Commercial formulas.** Commercial infant formulas are an option if they are affordable and there will be reliable supplies, as well as clean water, fuel, utensils, preparation skills, and time to prepare foods correctly and hygienically. Liquid commercial formulas based on modified animal milk or soy protein are closest in nutrient composition to breastmilk, but they lack essential fatty acids, hormones, immune cells, and other factors present in breastmilk. Commercial formulas also come in powdered form. Although these are often more affordable than liquid formula, they are not always hygienic. Many contain contaminants and, occasionally, some contain bacteria dangerous to young infants (266).

A number of clinical trials are underway or planned to assess whether antiretroviral drugs can reduce HIV transmission through breastfeeding beyond the first weeks postpartum.

- **Home-modified animal milk.** Milk from cows or goats is often readily available in either fresh or powdered form and can cost less than commercial formula. It is not fit for infants less than six months of age, however, unless it is properly modified. It must be diluted with clean boiled water to increase the fluid content and mixed with sugar to improve the energy content (*259*). Also, animal milk does not provide enough of certain minerals and vitamins (173). Supplementing animal milk with these micronutrients is essential but can be costly and thus beyond the reach of many people.

Seek antiretroviral treatment. Antiretroviral (ARV) drugs given to HIV-positive women during pregnancy and delivery and/or to infants during delivery and the first weeks of breastfeeding help treat their infection and can reduce the risk of HIV infection in their infants (*263*). Short courses of a single ARV and of combinations of ARV drugs such as zidovudine, lamivudine, and nevirapine reduce the risk of HIV transmission during pregnancy and labor (143, 224) as well as during the first weeks postpartum (71, *133*, 218). Many clinical trials have assessed these drugs for safety and effectiveness and found that they both decrease replication of HIV in the mother and help protect the infant during and after exposure to the virus (248). Efavirenz, which is used in some ARV combinations, should not be given to pregnant women because it interferes with fetal central nervous system development (*262*).

A number of clinical trials are underway or planned to assess whether these drugs can reduce HIV transmission through breastfeeding beyond the first weeks postpartum. Some drug regimens involve treating the mother both during late pregnancy and breastfeeding in order to reduce the amount of virus in her breastmilk (*74*). Others involve giving ARVs to uninfected breastfed infants to reduce the chances of infection through breastfeeding (*74*).

Clinical trials are planned or underway in Ethiopia, India, and Uganda to treat uninfected infants during their first six weeks of life. Studies in Botswana, Rwanda, Tanzania, Uganda, South Africa, and Zimbabwe will treat infants for their first six months of life. Also, the clinical trial in Botswana, as well as clinical trials in Burkina Faso, Kenya, Malawi, and Tanzania, will treat mothers with highly active antiretroviral therapy (HAART) up to six months postpartum to attempt to reduce transmission during breastfeeding (*74*). In a subset of women and infants from the Botswana trial, nevarapine concentrations in breastfeeding infants of mothers who received this ARV for nearly four months postpartum reached levels that can inhibit HIV infection (*204*).

Another option being explored is directly treating breastmilk with microbicides—agents that kill HIV. Initial studies suggest that the microbicide sodium dodecyl sulfate (SDS) holds promise. Adding a small amount of SDS to breastmilk kills all HIV without harming breastmilk (*237*).

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Programs to prevent mother-to-child transmission of HIV are expanding, but they still have little coverage at this point (165). In the countries most affected by AIDS, an estimated 10% of pregnant women are currently offered services to prevent HIV transmission during pregnancy and childbirth (107). One strategy not sufficiently emphasized is avoiding unwanted pregnancies among women with HIV. In public health terms, avoiding unwanted pregnancies would be the single action that would most reduce the number of infants infected with HIV (261). Rather, most programs focus on antiretro-viral treatment, preventing HIV infection among parents-to-be, and on ensuring safe delivery practices. HIV-positive pregnant women also learn how to reduce the risk of passing HIV infection to their infants and how to most safely feed their infants such as by exclusively breastfeeding for the first months of life (*119*).

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