

# HHS Blueprint for Action on Breastfeeding



Department of Health and Human Services  
Office on Women's Health



# Breastfeeding

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**The Office on Women's Health would like to acknowledge the following agencies and offices for their contributions:**

- Administration for Children and Families
- Agency for Healthcare Research and Quality
- Agency for Toxic Substances and Disease Registry
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***Department of Health and Human Services  
Office on Women's Health***

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## A MESSAGE FROM THE SURGEON GENERAL

Breastfeeding is one of the most important contributors to infant health. Breastfeeding provides a range of benefits for the infant's growth, immunity, and development (1). In addition, breastfeeding improves maternal health and contributes economic benefits to the family, health care system, and workplace (2).

Despite the many benefits of breastfeeding, the rates of breastfeeding in the United States are low, especially at 6 months postpartum. In 1998, the year for which the most recent statistics are available, only 29% of all mothers breastfed at 6 months postpartum (3). Moreover, racial and ethnic disparities in breastfeeding rates are wide and reveal alarmingly low breastfeeding rates among African American women (19% at 6 months postpartum) (3). The nation must address these low breastfeeding rates as a public health challenge and put in place national, culturally appropriate strategies to promote breastfeeding.

During the past 15 years, the Office of the Surgeon General has highlighted the public health importance of breastfeeding through numerous workshops and publications. In 1984, the Office of the Surgeon General held the first workshop on breastfeeding and human lactation, which made the following recommendations:

- "Improve professional education in human lactation and breastfeeding
- Develop public education and promotional efforts
- Strengthen the support for breastfeeding in the health care system
- Develop a broad range of support services in the community
- Initiate a national breastfeeding promotion effort directed to women in the world of work
- Expand research on human lactation and breastfeeding" (4-5).

In 1985 and 1991, reports were developed to describe the various breastfeeding promotion activities that resulted in follow-up to the Surgeon General's workshop, such as legislation, policies, resolutions, guidelines, meetings, publications, media campaigns, service delivery models, support systems, and research (5-6).

In 1990, the United States recognized the importance of breastfeeding by signing the *Innocenti Declaration on the Protection, Promotion, and Support of Breastfeeding* adopted by the World Health Organization and United Nations Children's Fund (UNICEF)(7). Concurrently, the U.S. Department of Health and Human Services, through its Healthy People 2000 and subsequently Healthy People 2010, established breastfeeding objectives for the early postpartum period, at 6 months postpartum, and at 1 year postpartum. In addition, recognition of the benefits of breastfeeding has led to the adoption of breastfeeding policies by many health and professional organizations in the United States, including

the American Academy of Pediatrics (8), the American College of Obstetricians and Gynecologists (9), the American Academy of Family Physicians (10), the American Dietetic Association (11), the American College of Nurse-Midwives (12), the National Medical Association (13), and the American Public Health Association (14).

To advance these efforts further, I requested the Office on Women's Health, in conjunction with other Federal agencies and health care professional organizations, to assist me in developing this Blueprint for Action on Breastfeeding. Under the auspices of the Environmental Health Policy Committee, the Office on Women's Health created the Subcommittee on Breastfeeding, consisting of government representatives from various Federal agencies and liaison members from non-federal organizations (Box 1). This Blueprint for Action establishes a comprehensive breastfeeding policy for the nation.

The Blueprint for Action introduces an action plan for breastfeeding based on education, training, awareness, support and research. The plan includes key recommendations that were refined by the members and reviewers of the Subcommittee on Breastfeeding during their deliberations of science-based findings. Recognizing that breastfeeding rates are influenced by various factors, these recommendations suggest an approach in which all interested stakeholders come together to forge partnerships to promote breastfeeding. Each of us, whether we play a role at the Federal, State, local, or private level, must turn these recommendations into programs best suited for our own communities. Together we can shape a future in which mothers can feel comfortable and free to breastfeed their children without societal hindrances. While there has been considerable progress toward reaching this goal, there remains a significant challenge to reach African American women with culturally appropriate approaches to promote breastfeeding.

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## BREASTFEEDING AS A PUBLIC HEALTH CHALLENGE

Breastfeeding is the ideal method of feeding and nurturing infants:

- Breast milk is the most complete form of nutrition for infants.
- Breastfeeding protects an infant from a wide array of infectious and noninfectious diseases.
- Breastfeeding improves maternal health by reducing postpartum bleeding and may lower the risk of premenopausal breast cancer and ovarian cancer.

Despite the well-recognized benefits of breastfeeding, the Healthy People 2000 goals for breastfeeding were not met (2-3). These goals were to increase to 75% the proportion of mothers who breastfeed their babies in the early postpartum period, and to increase to 50% the proportion of mothers who breastfeed their babies through 5 to 6 months of age (3). In 1998, 64% of all mothers breastfed in the early postpartum period and only 29% breastfed at 6 months postpartum (3).

One of the two major goals of Healthy People 2010 is to eliminate health disparities among different segments of the population (3). Racial and ethnic disparities in breastfeeding are wide despite substantial increases in breastfeeding rates in the last decade (15). In 1998, 45% of African American mothers breastfed their infants in the early postpartum period; 66% of Hispanic mothers and 68% of white mothers did so. Furthermore, in 1998, 54% of low-income Asian and Pacific Islander children and 59% of low-income American Indian and Alaska native children were ever breastfed (16).

No group of women reached the goal of breastfeeding for 5 to 6 months postpartum (50%), and again, disparities exist across racial and ethnic groups (19% of African American mothers, 28% of Hispanic mothers, and 31% of white mothers breastfed). (See Box 3).

In Healthy People 2010, an additional objective was added for 25% of mothers to breastfeed their babies through the end of 1 year (3). Only 9% of African American mothers met this objective in 1998, whereas 17% of Hispanic and 19% white mothers met the goal.

### Box 2: Definitions

**Breastfeeding:** The Institute of Medicine report *Nutrition During Lactation* applies the term "exclusive breastfeeding" when infants are fed only by this method; "partial breastfeeding" when breastfeeding is supplemented with limited amounts of formula, juice, water, or solid foods; and "minimal breastfeeding" when the infant receives nearly all sustenance from formula and other foods (1). In this HHS document, "breastfeeding" and "human milk" are interchangeable terms.

**Human Lactation:** The process of milk production in which human milk is secreted by the mammary glands, which are located within the fatty tissue of the breasts.

**Healthy People 2000:** A national cooperative effort by government agencies and voluntary and professional organizations to improve the health of all Americans by establishing health objectives and measuring progress toward those objectives. Its purpose is to promote health and prevent disease through changes in lifestyle and other factors. Healthy People 2000 set three broad goals to: 1. Increase the span of healthy lives for Americans, 2. Reduce health disparities among Americans, and 3. Achieve access to preventive services for all Americans (2).

**Healthy People 2010:** Contains broad reaching national health goals for the new decade, focusing on two major themes: 1. Increase quality and years of healthy life, and 2. Eliminate health disparities (3).

*This document presents the consensus of the members and reviewers on the HHS Subcommittee on Breastfeeding; it does not necessarily reflect the policy of the non-federal representative organizations.*

**Box 3: Racial and Ethnic Disparities in Breastfeeding Rates and Healthy People 2010 Breastfeeding Objectives for the Nation<sup>3</sup>**

<b>Objective: Increase the proportion of mothers who breastfeed their babies</b>	<b>1998 Baseline Percent (%)</b>	<b>2010 Target</b>
<b>In early postpartum period</b>		
All women	64	75
Black or African American	45	75
Hispanic or Latino	66	75
White	68	75
<b>At 6 months</b>		
All women	29	50
Black or African American	19	50
Hispanic or Latino	28	50
White	31	50
<b>At 1 year</b>		
All women	16	25
Black or African American	9	25
Hispanic or Latino	19	25
White	17	25

A number of reasons might explain why so few African American mothers breastfeed. Breastfeeding is not viewed positively among African American women (17). Furthermore, it has been difficult for African American women to receive information and education about breastfeeding, to have breastfeeding initiated in the hospital, to continue breastfeeding in the early days in the home setting, and to continue breastfeeding for an extended period (17).

Increasing the rates of breastfeeding is a compelling public health goal, particularly among the racial and ethnic groups who are less likely to initiate and sustain breastfeeding throughout the infant’s first year (3).

Significant steps must be taken to increase breastfeeding rates in the United States and to close the wide racial and ethnic gaps in breastfeeding. This goal can only be achieved by supporting breastfeeding in the family, community, workplace, health care sector, and society. This Blueprint for Action introduces a comprehensive framework to increase breastfeeding rates in the United States and to promote optimal breastfeeding practices.

**BENEFITS OF BREASTFEEDING**

Extensive research on the biology of human milk and on the health outcomes associated with breastfeeding has established that breastfeeding is more beneficial than formula feeding. Breastfed infants experience fewer cases of infectious and noninfectious diseases as well as less severe cases of diarrhea, respiratory infections, and ear infections (18-32). Mothers who breastfeed experience less postpartum bleeding, earlier return to pre-pregnancy weight, and a reduced risk of ovarian cancer and premenopausal breast cancer (33-43). Furthermore, breastfeeding is cost-beneficial to families (26). Based on this evidence, the American Academy of Pediatrics has stated that “The breastfed infant is the reference or normative model against which all alternative feeding methods must be measured with regard to growth, health, development, and all other short- and long-term outcomes” (8). Thus, human milk is uniquely suited for human infants.

**Resistance to Infectious Diseases**

Human milk contains an abundance of factors that are active against infection. Since the infant’s immune system is not fully mature until about 2 years of age, the transfer of these factors from human milk provides a distinct advantage that infants fed formula do not experience. Specifically, human milk contains immunologic agents and other compounds, such as secretory antibodies, leukocytes, and carbohydrates,

**Box 4: Infections that Are Lower in Incidence or Severity in Breastfed Infants than in Formula-fed Infants**

- Diarrhea (18, 21, 29-30, 46)
- Respiratory tract infection (18, 21, 46-49)
- Otitis media (19, 29, 50-51)
- Pneumonia (52-53)
- Urinary infection (54-55)
- Necrotizing enterocolitis (56-57)
- Invasive bacterial infection (44, 59-61)

that act against viruses, bacteria, and parasites (44-45). Overall, research shows that breastfeeding may decrease the incidence of several acute bacterial and viral infections in infants (Box 4).

**Enhanced Immune System**

Breastfed infants, compared with formula-fed infants, produce enhanced immune responses to polio, tetanus, diphtheria, and Haemophilus influenzae immunizations, and to respiratory syncytial virus infection, a common infant respiratory infection (44, 62-63). Human milk contains anti-inflammatory factors and other factors that regulate the response of the immune system against infection (44). There is also evidence that breastfeeding results in earlier development of the infant immune system (64).

Protection against infection is strongest during the first several months of life for infants who are breastfed exclusively (19, 21, 29, 46-48, 59). Several studies suggest that the benefits continue even after breastfeeding ceases (19, 21, 61), and a few studies have found that breastfeeding into the second 6 months of life protects against infection (29-30, 52). Longer durations of breastfeeding may provide an even stronger protective effect (19, 21, 51, 61, 65). Finally, children who were breastfed exclusively have fewer illnesses than those who were never breastfed (19, 46, 48).

**Nutritional and Growth Benefits**

Human milk contains a balance of nutrients that more closely matches human infant requirements for growth and development than does the milk of any other species (66). For example, compared to cow’s milk, human milk is low in total protein and low in casein, making it more readily digestible and less stressful on immature infant kidneys. The lipids and enzymes in human milk promote efficient digestion and utilization of nutrients (66-67).

Scientific evidence suggests that the normal pattern for breastfed infants is to gain less weight and to be leaner



at 1 year of age than formula-fed infants, while maintaining normal activity level and development (68). This early growth pattern may influence later growth patterns, resulting in less overweight and obesity among children who were breastfed (68-76). Despite the finding that many African American infants are premature or small at birth, premature babies fare better when breastfed compared to premature babies who are fed formula (69, 77).

### **Reduced Risk for Chronic Diseases**

Many studies in infant feeding have found lower rates of several chronic childhood diseases among children who were breastfed. Recent findings suggest that breastfeeding may reduce the risk of type 1 and 2 diabetes (78-82), celiac disease (83-85, 87), inflammatory bowel disease (88-90), childhood cancer (28, 91-92), and allergic disease/asthma (32, 96-100). Mixed results from some studies suggest that further research is needed to establish some of these benefits (86, 93-95).

### **Developmental Benefits**

Considerable interest has been raised about the potential effect of breastfeeding on cognitive development (101-107). Long-chain polyunsaturated fatty acids, available in breast milk, are important for brain growth and development (103-107). Observations in some studies on neurological and cognitive outcomes in breastfed children have led to a hypothesis that the early visual acuity and cognitive function of these children is greater than in non-breastfed children (101, 104-105). However, this hypothesis has not been conclusively proven (102,106).

### **Improved Maternal Health**

Breastfeeding has several positive hormonal, physical, and psychosocial effects on the mother. Breastfeeding increases levels of oxytocin, a hormone that stimulates uterine contractions, helping to expel the placenta, to minimize postpartum maternal blood loss, and to

induce a more rapid uterine involution (1, 108). Breastfeeding, particularly exclusive breastfeeding, delays the resumption of normal ovarian cycles and the return of fertility in most women (109). Mothers who breastfeed their infants may also experience psychological benefits, such as increased self-confidence and facilitated bonding with their infants (110-112).

Studies have shown that breastfeeding for longer time periods (up to 2 years) and among younger mothers (early 20s) may reduce the risk of premenopausal and possibly postmenopausal breast cancer (35-40, 113). In addition, the risk of ovarian cancer may be lower among women who have breastfed their children (41-43).

### **Socioeconomic Benefits**

Breastfeeding provides economic and social benefits to the family, the health care system, the employer, and the nation (114). Families can save several hundred dollars over the cost of feeding breast milk substitutes, even after accounting for the costs of breast pump equipment and additional food required by the nursing mother (115). Breastfed infants typically require fewer sick care visits, prescriptions, and hospitalizations, especially if breastfed exclusively or almost exclusively (26). Consequently, total medical care expenditures were about 20% lower for fully breastfed infants than for never-breastfed infants (116). Because of the high occurrence of poverty among African Americans, these families would benefit substantially from breastfeeding their infants (117).

Employers also benefit when their employees breastfeed. Breastfed infants are sick less often; therefore, maternal absenteeism from work is significantly lower in companies with established lactation programs (118). In addition, employer medical costs are lower and employee productivity is higher.

## **CAUTIONS ABOUT BREASTFEEDING**

Human milk provides the most complete form of nutrition for infants, including premature and sick newborns, with rare exceptions (8). When direct breastfeeding is not possible, expressed human milk, fortified when necessary for the premature infant, should be provided (8). Professional health care advice against breastfeeding or recommendations about premature weaning should be based on a careful consideration of the general benefits of breastfeeding, the risks of not receiving human milk, and the most up-to-date information about the following situations.

*Under certain conditions, women should not breastfeed:*

- **HIV-infected women in the United States** should not breastfeed or provide their breast milk for the nutrition of their own or other infants because of the risk of HIV transmission to the child (119-121). In countries with populations at increased risk for other infectious diseases and nutritional deficiencies resulting in infant death, the mortality risks associated with not breastfeeding may outweigh the possible risk of transmission of HIV infection (8).
- **Women with human T-cell leukemia virus type 1 (HTLV-1)** should not breastfeed because of the risk of transmission to the child (122).

*Under certain conditions, a case-by-case assessment should be made of whether or not breastfeeding is advisable or should be temporarily suspended. A physician should evaluate cases involving:*

- **Environmental Exposures:** During the last 30 years, environmental chemicals, such as polychlorinated biphenyls (PCBs), DDT, dioxin, methyl mercury, and lead have appeared in breast milk without occupational or even known exposure on the part of the woman (Appendix 1) (123). Although most women have detectable levels of these agents, there are no established “normal” or “abnormal” values for clinical interpretation; therefore, breast milk is not routinely tested for these environmental pollutants. Thus far, effects on the nursing child have been seen primarily in poisonings where the mother herself was clinically ill (124).

Advisories are issued by the states, U.S. territories, Native American tribes, and the Environmental Protection Agency to inform residents of potential health risks from consuming contaminated noncommercially caught fish and wildlife. These advisories identify specific fish and wildlife species from specific water bodies (125). These fish advisories should be followed.

- **Hepatitis C:** Transmission of hepatitis C through breast milk has not been established. The risk of infection among infants of infected mothers is the same whether breast or bottle fed. However, bleeding or cracked nipples on the breast of a woman positive for hepatitis C may put a breastfeeding infant at risk for transmission of hepatitis C (126).
- **Illicit Drugs:** Amphetamines, cocaine, heroin, marijuana, and phencyclidine should not be ingested by the nursing mother. Not only are they hazardous to the nursing infant, but also they are detrimental to the physical and emotional health of the mother. This list is not complete; no drug of abuse should be ingested by nursing mothers even in the absence of adverse reports in the literature (127-128).
- **Implants and Breast Surgery:** It is not known whether breastfeeding by women who have breast implants has an effect on the nursing infant (129). Many women with implants lactate successfully. Women who have had reduction mammoplasty may not be able to lactate if the glandular tissue has been removed or the connection between it and the nipple is interrupted.
- **Metabolic Disorders:** An infant born with galactosemia cannot metabolize lactose, a sugar found in all mammalian milk. Such infants must be fed plant-derived formula (130). Infants with phenylketonuria can be successfully breastfed, but doing so requires special clinical management (131).
- **Pharmaceutical Drugs:** For most prescribed and over-the-counter medications taken by women, the risk to the nursing infant is unknown. A few medications make it necessary to discontinue breastfeeding.

For example, cyclophosphamide, cyclosporin, doxorubicin, ergotamine, methotrexate, and radioactive isotopes are prohibited during lactation (8, 127). Pharmaceutical drugs that effect the central nervous system, such as anti-anxiety, anti-depressant, and anti-psychotic agents, are of special concern when taken by nursing mothers (127). Some pharmaceutical agents such as bromocriptine and possibly estrogens in contraceptive doses make breastfeeding more difficult because they decrease breast milk production and consequently shorten breastfeeding duration (127). A woman taking any of those drugs should not breastfeed without first consulting her health care provider.

- **Tobacco and Alcohol Consumption:** Alcohol appears in breast milk (132-133). For this reason, and for the general health of the mother, if alcohol is used, intake should be limited. The American Academy of Pediatrics Committee on Drugs lists alcohol as “usually compatible with breastfeeding” (127). Nursing mothers should not smoke. Nicotine is present in the breast milk of smokers and may adversely affect milk volume (134). However, for women who cannot or will not stop smoking, breastfeeding is still advisable, since the benefits of breast milk outweigh the risks from nicotine exposure.

## FACILITATION AND SUPPORT FOR BREASTFEEDING

A woman’s ability to optimally breastfeed her infant depends on the support she receives from those around her. Several factors and contexts facilitate the initiation and continuation of breastfeeding; others may pose barriers. The overriding principle is to make breastfeeding as easy as possible for the mother rather than to discourage her from breastfeeding, either intentionally or unintentionally.

### *Health Care System*

The health care system has an important role to play in the promotion and support of breastfeeding (135-140). Breastfeeding support is particularly critical in the first few weeks postpartum, as lactation is being established (141). Therefore, all breastfeeding mothers must have access to lactation management support provided by trained physicians, nurses, lactation specialists, peer counselors, and other trained health care providers, especially during the first days and weeks postpartum (142).

All health care providers who interact with women or infants should be knowledgeable about the basics of lactation and the role their specialty plays in breastfeeding (135-140). Providers of maternal and child health care have a special role in the promotion of breastfeeding during the prenatal and postnatal periods. They must be knowledgeable and skillful in

counseling women about breastfeeding and lactation, and in providing medical care to breastfeeding mothers and their babies. To this end, culturally appropriate training for breastfeeding should be integrated into the curricula of health profession schools. Special attention should be given to barriers to breastfeeding for all women, especially African American and other minority women (143). Breastfeeding training should also be provided under the continuing education requirements for practitioners.

Early experience with breastfeeding is critical, and nonsupportive hospital experiences and lack of support from health care providers have been identified as barriers to breastfeeding, especially among African American women (17). Therefore, maternity care and newborn facilities should follow practices conducive to proper lactation (144-145) even when in-hospital maternity care is of short duration. For example, hospitals and other maternity centers are encouraged to adopt the “Ten Steps to Successful Breastfeeding” as outlined by the United Nations Children’s Fund, the World Health Organization, the Breastfeeding Hospital Initiative Feasibility Study Expert Work Group, and Baby Friendly USA (146-149) (Box 5). Furthermore, the 1984 Surgeon General’s Workshop on Breastfeeding and Human Lactation recommended several hospital practices, presented in Box 6, which influence breastfeeding initiation and are important during hospital stays (4).

### **Box 5: Practices for Successful Breastfeeding Services at Hospital and Maternity Centers 146-149**

- A written breastfeeding policy that is communicated to all healthcare staff
- Staff training in the skills needed to implement the policy
- Education of pregnant women about the benefits and management of breastfeeding
- Early initiation of breastfeeding
- Education of mothers on how to breastfeed and maintain lactation
- Limited use of any food or drink other than human breast milk
- Rooming-in
- Breastfeeding on demand
- Limited use of pacifiers and artificial nipples
- Fostering of breastfeeding support groups and services

**Box 6: Hospital Practices Which Influence Breastfeeding Initiation 4**

← **Strongly Encouraging** → **Encouraging** → **Discouraging** → **Strongly Discouraging** →

Physical Contact	<ul style="list-style-type: none"> <li>• baby put to breast immediately in delivery room</li> <li>• baby not taken from mother after delivery</li> <li>• woman helped by staff to suckle baby in recovery room</li> <li>• rooming-in; staff help with baby care in room, not only in nursery</li> </ul>	<ul style="list-style-type: none"> <li>• staff sensitivity to cultural norms and expectations of woman</li> </ul>	<ul style="list-style-type: none"> <li>• mother-infant separation at birth</li> <li>• mother-infant housed on separate floors in post-partum period</li> <li>• mother separated from baby due to bilirubin problem</li> <li>• no rooming-in policy</li> </ul>
Verbal Communication	<ul style="list-style-type: none"> <li>• staff initiates discussion re: woman's intention to breastfeed pre- and intrapartum</li> <li>• staff encourages and reinforces breastfeeding immediately on labor and delivery</li> <li>• staff discusses use of breast pump and realities of separation from baby, re: breastfeeding</li> </ul>	<ul style="list-style-type: none"> <li>• appropriate language skills of staff, teaching how to handle breast engorgement and nipple problem</li> <li>• staff's own skills and comfort re: art of breastfeeding and time to teach woman on one-to-one basis</li> </ul>	<ul style="list-style-type: none"> <li>• staff instructs woman "to get good night's rest and miss the feed"</li> <li>• strict times allotted for breastfeeding regardless of mother/baby's feeding "cycle"</li> <li>• woman told to "take it easy," "get your rest" . . . impression that breastfeeding is effortful/tiring</li> <li>• woman told she doesn't "do it right," staff interrupts her efforts, corrects her re: positions, etc.</li> </ul>
Non-Verbal Communication	<ul style="list-style-type: none"> <li>• pictures of woman breastfeeding</li> <li>• literature on breastfeeding in understandable terms</li> <li>• staff (doctors as well as nurses) give reinforcement for breastfeeding (respect, smiles, affirmation)</li> <li>• nurse (or any attendant) making mother comfortable and helping to arrange baby at breast for nursing</li> <li>• woman sees others breastfeeding in hospital</li> </ul>	<ul style="list-style-type: none"> <li>• pictures of woman bottle-feeding</li> <li>• staff interrupts her breastfeeding session for lab tests, etc.</li> <li>• woman doesn't see others breastfeeding</li> </ul>	<ul style="list-style-type: none"> <li>• woman given infant formula kit and infant food literature</li> <li>• woman sees official-looking nurses authoritatively caring for babies by bottle-feeding (leads to woman's insecurities re: own capability of care)</li> </ul>
Experiential	<ul style="list-style-type: none"> <li>• if breastfeeding not immediately successful, staff continues to be supportive</li> <li>• previous success with breastfeeding experience in hospital</li> </ul>		<ul style="list-style-type: none"> <li>• previous failure with breastfeeding experience in hospital</li> </ul>

## The Workplace

A large proportion (70%) of employed mothers who have children under 3 years of age work full time (150). About one-third of these mothers return to work within 3 months and about two-thirds within 6 months after the baby is born (151-152). However, African American women are more likely than other women to return to work earlier (8 weeks) and to be engaged in jobs that do not allow the mother to be successful at breastfeeding (153). The workplace environment should enable mothers to continue breastfeeding as long as the mother and baby desire. Worksite programs that support breastfeeding will facilitate the continuation of breastfeeding after mothers return to their jobs (154-155). Such programs include:

- "Prenatal lactation education specifically tailored for working women
- Corporate policies providing information for all employees on the benefits of breastfeeding and services available to support breastfeeding women
- Education for personnel about why their breastfeeding co-workers need support
- Adequate breaks, flexible work hours, job sharing and part-time work
- Private "Mother's Rooms" for expressing milk in a secure and relaxing environment
- Access to hospital-grade, autocycling breast pumps at the workplace
- Small refrigerators for safe storage of breast milk
- Subsidization or purchase of individually owned portable breast pumps for employees
- Access to a lactation professional on-site or by phone to give breastfeeding education, counseling and support during pregnancy, after delivery and when the mother returns to work
- Coordination with on-site or near-site child care programs so infant can be breastfed during the day
- Support groups for working mothers with children" (156)

## Childcare Facilities

With a large number of infants enrolled in childcare, it is also important that childcare facilities be supportive of breastfeeding (157). Childcare centers should make accommodations for mothers who wish to breastfeed their children or have their children fed expressed milk at the facility.

## Public Education and Support

All breastfeeding women and their partners need reliable and culturally appropriate sources of information and social support for breastfeeding (158-159). Depending on a woman's needs, various levels of skill and training may be called for, from lactation consultants or specialists to peer counselors to other mothers who have breastfed (160). Women may access information through books, web pages, information phone lines, hotlines, home visits, prenatal/postpartum classes, or mother-to-mother support groups.

Social support, particularly peer support, is critical for special populations with lower breastfeeding rates (e.g., African Americans, teen mothers) (161-162). More broadly, the views and perceptions of those interacting with a woman can affect her view on breastfeeding, particularly those of the infant's father (141). Health education in schools should include information on the importance of breastfeeding for children's and women's health. Educational campaigns should be directed toward fathers, especially African American fathers, and other family members (e.g., grandmothers) who greatly influence the woman's decision to breastfeed (141, 163-167).

A public health social marketing effort is needed to increase breastfeeding rates. In addition to culturally appropriate interventions, the social marketing effort would include a media campaign which presents images of breastfeeding as the normal way to feed infants in most places women and their infants go (168-169).



### ***Marketing of Breast Milk Substitutes***

The marketing of infant formula negatively affects breastfeeding (142, 170-172). The International Code of Marketing of Breast Milk Substitutes and a subsequent WHO resolution delineates guidelines for formula marketing to ensure that it does not interfere with the establishment of lactation (173). The International Code stipulates the responsibilities of manufacturing industries regarding their role in promoting breastfeeding and appropriate infant feeding practices.

### **MAJOR HHS BREASTFEEDING ACTIVITIES IN THE 1990s**

Since the 1991 follow-up to the Surgeon General's Workshop on Breastfeeding and Human Lactation, much has happened to advance the promotion, protection, and support of breastfeeding for families in the United States. In the 1990s, HHS supported the establishment of the United States Breastfeeding Committee (USBC). As a collaborative public-private partnership of about 30 major organizations, the USBC was created to satisfy one of the goals identified in the *Innocenti Declaration*: "Establishing of a multisectoral national breastfeeding committee composed of representatives from relevant government departments, nongovernmental organizations, and health professional associations" (7). In November 1998, HHS cosponsored the National Breastfeeding Policy Conference in Washington, D.C., which generated recommendations for setting a national policy agenda to promote, protect, and support breastfeeding well into the 21st century. Many of the themes that emerged from the 1984 Surgeon General's Workshop on Breastfeeding and Human Lactation continued as a thread throughout this conference.

HHS, through the Health Resources and Services Administration's Maternal and Child Health Bureau, requested that the USBC provide a strategic plan to implement this policy agenda. The breastfeeding strategic plan (Appendix 2) sets forth goals and objectives to improve breastfeeding initiation and duration, to reduce and remove barriers to breastfeeding, to provide equitable access to lactation care and services, and to promote breastfeeding as the cultural norm for infant and child feeding (174). The USBC strategic plan for breastfeeding was closely reviewed and considered during the development of the Blueprint for Action.

HHS agencies support breastfeeding through a variety of programs. The Health Resources and Services Administration provides substantial support for breastfeeding provider training and research. The Centers for Disease Control and Prevention plays a major role in supporting breastfeeding nationally through applied research, program evaluation, and surveillance. The

National Institutes of Health provides substantial support for breastfeeding research, totaling \$13 million in FY 1998. The Food and Drug Administration regulates manufacturers of breast pumps and ensures their safety and effectiveness. This includes a review of design performance, labeling instructions, and applications.

## BLUEPRINT FOR ACTION ON BREASTFEEDING

Infants should be exclusively breastfed during the first 4 to 6 months of life (175), preferably for a full 6 months (8-9). Ideally, breastfeeding should continue through the first year of life (8-9, 175). This Blueprint for Action reaffirms the scientific evidence that breastfeeding is the best method for feeding most newborns, and that breastfeeding is beneficial to the infant's and the mother's health. Achieving an increase in the proportion of mothers who breastfeed their babies will require the collaboration of Federal agencies, State and local governments, communities, health professional organizations, advocacy groups, multidisciplinary scientists, industry, health insurers, and the American people. This Blueprint for Action invites all interested stakeholders to forge partnerships for the promotion of breastfeeding. It is also designed to attract broad-based family, community, professional, corporate, and philanthropic participation in order to better focus the public's attention and to motivate actions at the individual and community levels.

Moreover, this Blueprint for Action is directed toward all women and cuts across all racial and ethnic populations, socio-economic classes, educational groups, and employment arrangements. It concentrates energy in key breastfeeding promotion domains and denotes responsibility for a definitive course of action by the various stakeholders to achieve a greater proportion of breastfeeding mothers in American society.

To achieve the Healthy People 2010 Breastfeeding Objectives for the Nation (Box 3), the Blueprint for Action recommends that the following steps be taken by the health care system, the workplace, the family, and the community, and identifies several areas of research.

### **Health Care System**

- Train health care professionals who provide maternal and child care on the basics of lactation, breastfeeding counseling, and lactation management during coursework, clinical and in-service training, and continuing education.
- Ensure that breastfeeding mothers have access to comprehensive, up-to-date, and culturally tailored

lactation services provided by trained physicians, nurses, lactation consultants, and nutritionists/dietitians.

- Establish hospital and maternity center practices that promote breastfeeding, such as the "Ten Steps to Successful Breastfeeding" (Box 5).
- Develop breastfeeding education for women, their partners, and other significant family members during the prenatal and postnatal visits.

### **Workplace**

- Facilitate breastfeeding or breast milk expression in the workplace by providing private rooms, commercial grade breast pumps, milk storage arrangements, adequate breaks during the day, flexible work schedules, and onsite childcare facilities.
- Establish family and community programs that enable breastfeeding continuation when women return to work in all possible settings.
- Encourage childcare facilities to provide quality breastfeeding support.

### **Family and Community**

- Develop social support and information resources for breastfeeding women such as hotlines, peer counseling, and mother-to-mother support groups.
- Launch and evaluate a public health marketing campaign portraying breastfeeding as normal, desirable, and achievable.
- Encourage the media to portray breastfeeding as normal, desirable, and achievable for women of all cultures and socioeconomic levels.
- Encourage fathers and other family members to be actively involved throughout the breastfeeding experience.

### **Research**

- Conduct research that identifies the social, cultural, economic, and psychological factors that influence infant feeding behaviors, especially among African American and other minority and ethnic groups.
- Improve the understanding of the health benefits of breastfeeding, especially in reducing the risk for chronic childhood diseases among disadvantaged infants and children.
- Monitor trends on the incidence and duration of exclusive, partial, and minimal breastfeeding, including minority and ethnic groups.
- Compare the cost-effectiveness of different programs that promote, protect, and support breastfeeding to ensure optimal use of resources.
- Conduct research to better understand the role of fathers in promoting breastfeeding.
- Evaluate the influence of brief postpartum hospital stays on the initiation and duration of breastfeeding.
- Determine the safety of over-the-counter and prescription products taken by lactating women on infant health
- Conduct a large, well-designed case-control study on the effects of breast implants on childhood disorders.



## CONCLUSION

Americans in communities nationwide can make a significant difference in promoting and supporting breastfeeding. The recommendations presented in this Blueprint for Action provide an action plan and call for action now. Programs and activities that are implemented and evaluated today will generate additional recommendations for effective breastfeeding promotion initiatives in the future. A collaborative approach is needed to make progress in meeting the Healthy People 2010 breastfeeding goals. The Blueprint for Action is an important step in responding to this major public health challenge of promoting breastfeeding. However, the Healthy People 2010 goals will be realized only when society is supportive of breastfeeding, and only when mothers, especially African American mothers, have been reached with culturally appropriate information and support to breastfeed their infants.

*For further information on breastfeeding and breastfeeding resources, please visit the HHS/OWH website at [www.4woman.gov](http://www.4woman.gov) or call 1-800-994-9662 or TDD 1-888-220-5446.*

### Preparation of the Report

In March 1998, the Environmental Health Policy Committee, which is chaired by the Surgeon General of the United States, requested that the HHS Office on Women's Health lead the Subcommittee on Breastfeeding in preparing the HHS Blueprint for Action on Breastfeeding. Federal representatives throughout the Department of Health and Human Services worked in partnership with the Department of Agriculture, the Environmental Protection Agency, and the U.S. Agency for International Development to develop this report. The Federal Liaison Members on the Subcommittee on Breastfeeding represent individuals with a broad range of expertise in breastfeeding: leaders of nonprofit breastfeeding organizations; representatives from major hospital, medical, and nursing organizations; private sector experts; and university-based researchers.

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## REFERENCES

1. Institute of Medicine. Nutrition During Lactation. Washington, DC: National Academy Press, 1991, pp. 24-25, 161-171, 197-200.
2. U.S. Department of Health and Human Services. Healthy People 2000: National Health Promotion and Disease Prevention Objectives. Washington, DC: U.S. Department of Health and Human Services, Public Health Service, Office of the Assistant Secretary for Health, 1990, pp. 6, 379-380. DHHS pub. no. PHS 91-50212.
3. U.S. Department of Health and Human Services. Healthy People 2010: Conference Edition - Volumes I and II. Washington, DC: U.S. Department of Health and Human Services, Public Health Service, Office of the Assistant Secretary for Health, January 2000, pp. 2, 47-48.
4. U.S. Department of Health and Human Services. Report of the Surgeon General's Workshop on Breastfeeding & Human Lactation. Rockville, MD: U.S. Department of Health and Human Services, Public Health Service, Health Resources and Services Administration, 1984. DHHS pub. no. HRS-D-MC 84-2.
5. U.S. Department of Health and Human Services. Followup Report: The Surgeon General's Workshop on Breastfeeding & Human Lactation. Rockville, MD: U.S. Department of Health and Human Services, Public Health Service, Health Resources and Services Administration, 1985. DHHS pub. no. HRS-D-MC 85-2.
6. Spisak, S, Gross S. Second Followup Report: The Surgeon General's Workshop on Breastfeeding & Human Lactation. Washington, DC: National Center for Education in Maternal and Child Health, 1991.
7. UNICEF/WHO. Innocenti Declaration on the Protection, Promotion and Support of Breastfeeding. Florence, Italy: UNICEF and WHO, 1990.
8. American Academy of Pediatrics. Policy Statement: Breastfeeding and the Use of Human Milk (RE9729). Pediatrics 1977;100(6):1035-1039.
9. American College of Obstetricians and Gynecologists. Breastfeeding: Maternal and Infant Aspects. ACOG Educational Bulletin No. 258. Washington, DC: American College of Obstetricians and Gynecologists, July 2000.
10. American Academy of Family Physicians. Breastfeeding and Infant Nutrition, 1994. 1998-1999 AAFP Reference Manual. Washington, DC: American Academy of Family Physicians, 1994, p. 51. <http://www.aafp.org/policy/75.html>.
11. American Dietetic Association. Position of the American Dietetic Association: Promotion of Breast-feeding. Washington, DC: American Dietetic Association, 1997. <http://www.eatright.org/adap0697.html>.
12. American College of Nurse-Midwives. Clinical Practices Statement on Breastfeeding. Washington, DC: American College of Nurse-Midwives, July 27, 1992. <http://www.acnm.org/prof/breast.html>.
13. National Medical Association. Pediatrics Section of the National Medical Association Statement on Breastfeeding: Promotion, Protection, and Support of Breastfeeding. Washington, DC: National Medical Association, May 2000.
14. American Public Health Association. Breastfeeding. APHA Public Policy Statements No. 7403 (1974), p. 149, and No. 8226 (1982). Washington, DC: American Public Health Association, 1982, p. 308.
15. U.S. Department of Health and Human Services. Healthy People 2000: Progress Review-Maternal and Infant Health. Hyattsville, MD: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Health Statistics, May 5, 1999, pp. 1-4. DHHS pub. no. PHS 99-1256.
16. U.S. Department of Health and Human Services. CDC Pediatric Nutrition Surveillance. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2000.

17. Caulfield LE, Gross SM, Bentley ME, et al. WIC-based interventions to promote breastfeeding among African-American women in Baltimore: Effects on breastfeeding initiation and continuation. *J Hum Lact* 1998;14(1):15-22.
18. Beaudry M, Dufour R, Marcoux S. Relation between infant feeding and infections during the first six months of life. *J Pediatr* 1995;126:191-197.
19. Duncan B, Ey J, Holberg CJ, Wright AL, Martinez FD, Taussig LM. Exclusive breast-feeding for at least 4 months protects against otitis media. *Pediatrics* 1993;91(5):867-872.
20. Frank AL, Taber LH, Glezen WP, Kasel GL, Wells CR, Paredes A. Breast-feeding and respiratory virus infection. *Pediatrics* 1982;70(2):239-245.
21. Howie PW, Forsyth JS, Ogston SA, Clark A, du V Florey C. Protective effect of breast feeding against infection. *BMJ* 1990;300:11-16.
22. Kovar MG, Serdula MK, Marks JS, Fraser DW. Review of the epidemiologic evidence for an association between infant feeding and infant health. *Pediatrics* (Suppl.) 1984;74:S615-S638.
23. Popkin BM, Adair L, Akin JS, Black R, Briscoe J, Fleger, W. Breast-feeding and diarrheal morbidity. *Pediatrics* 1990;86(6):874-882.
24. Saarinen UM. Prolonged breast feeding as prophylaxis for recurrent otitis media. *Acta Paediatric Scandinavia* 1982;71:567-571.
25. Moreland J, Coombs J. Promoting and Supporting Breast-feeding. *Am Fam Physician* 2000, 61:1093-1100, 2103-2104.
26. Ball TM, Wright AL. Health care costs of formula-feeding in the first year of life. *Pediatrics* (Suppl.) 1999;103(4):870-76.
27. Davis MK, Savitz DA, Graubard BI. Infant feeding and childhood cancer. *Lancet* 1988;2(8607):365-368.
28. Davis MK. Review of the evidence for an association between infant feeding and childhood cancer. *Int J Cancer* (Suppl.) 1998;11:29-33.
29. Dewey KG, Heinig MJ, Nommsen-Rivers LA. Differences in morbidity between breast-fed and formula-fed infants. *J Pediatr* 1995;126(5):696-702.
30. Duffy LC, Byers TE, Riepenhoff-Talty M, La Scolea LJ, Zielezny M, Orga PL. The effects of infant feeding on rotavirus-induced gastroenteritis: a prospective study. *Am J Public Health* 1986;76(3):259-263.
31. Heinig MJ, Dewey KG. Health advantages of breast feeding for infants: a critical review. *Nutrition Research Reviews* 1996;9:89-110.
32. Wright AL, Holberg, CJ, Taussig LM, Martinez, FD. Relationship of infant feeding to recurrent wheezing at age 6 years. *Arch Pediatr Adolesc Med* 1995;149:758-763.
33. Chua S, Arulkumaran S, Lim I, Selamat N, Ratnam SS. Influence of breastfeeding and nipple stimulation on postpartum uterine activity. *Br J Obstet Gynecol* 1994;101:804-805.
34. Dewey KG, Heinig MJ, Nommsen LA. Maternal weight-loss patterns during prolonged lactation. *Am J Clin Nutr* 1993;58:162-166.
35. Newcomb PA, Storer BE, Longnecker MP, et al. Lactation and a reduced risk of premenopausal breast cancer. *N Engl J Med* 1994;330(2):81-87.
36. Enger SM, Ross RK, Paganini-Hill A, Bernstein L. Breastfeeding experience and breast cancer risk among postmenopausal women. *Cancer Epidemiol Biomarkers Prev* 1998;7(5):365-369.
37. Marcus PM, Baird DD, Millikan RC, Moorman PG, Qaqish B, Newman B. Adolescent reproductive events and subsequent breast cancer risk. *Am J Public Health* 1999;89(8):1244-1247.

38. Weiss HA, Potischman NA, Brinton LA, et al. Prenatal and perinatal risk factors for breast cancer in young women. *Epidemiology* 1997;8(2):181-187.
39. Brinton LA, Potischman NA, Swanson CA, et al. Breastfeeding and breast cancer risk. *Cancer Causes and Control* 1995;6:199-208.
40. Newcomb PA, Egan KM, Titus-Ernstoff L, et al. Lactation in relation to postmenopausal breast cancer. *Am J Epidemiol* 1999;150(2):174-182.
41. Gwinn ML, Lee NC, Rhodes PH, Layde PM, Rubin GL. Pregnancy, breast feeding, and oral contraceptives and the risk of epithelial ovarian cancer. *J Clin Epidemiol* 1990;43(6):559-568.
42. Whittemore AS, Harris R, Itnyre J, and the Collaborative Ovarian Cancer Group. Characteristics relating to ovarian cancer risk: collaborative analysis of 12 US case-control studies. II. Invasive epithelial ovarian cancers in white women. *Am J Epidemiol* 1992;136(10):1184-1203.
43. Rosenblatt KA, Thomas DB, and the WHO Collaborative Study of Neoplasia and Steroid Contraceptives. Lactation and the risk of epithelial ovarian cancer. *Int J Epidemiol* 1993;22(2):192-197.
44. Goldman AS. The immune system of human milk: antimicrobial, antiinflammatory and immunomodulating properties. *Pediatr Infect Dis J* 1993;12(8):664-672.
45. Goldman AS, Goldblum RM, Hanson LA. Anti-inflammatory systems in human milk. *Adv Exp Med Biol* 1990;262:69-76.
46. Scariati PD, Grummer-Strawn LM, Fein SB. A longitudinal analysis of infant morbidity and the extent of breastfeeding in the United States. *Pediatrics* 1997;99(6):5.
47. Raisler J, Alexander C, O'Campo P. Breast-feeding and infant illness: a dose-response relationship? *Am J Public Health* 1999;89(1):25-30.
48. Cushing AH, Samet JM, Lambert WE, et al. Breastfeeding reduces risk of respiratory illness in infants. *Am J Epidemiol* 1998;147(9):863-870.
49. Wright AL, Holbert CJ, Martinez FD, Morgan WJ, Taussig LM, and Group Health Medical Associates. Breast feeding and lower respiratory tract illness in the first year of life. *BMJ* Oct. 14, 1989; 299:946-949.
50. Aniansson G, Alm B, Andersson B, et al. A prospective cohort study on breast-feeding and otitis media in Swedish infants. *Pediatr Infect Dis J* 1994;13(3):183-188.
51. Owen MJ, Baldwin CD, Swank PR, Pannu AK, Johnson DL, Howie VM. Relation of infant feeding practices, cigarette smoke exposure, and group child care to the onset and duration of otitis media with effusion in the first two years of life. *J Pediatr* 1993;123(5):702-711.
52. Levine OS, Farley M, Harrison LH, et al. Risk factors for invasive pneumococcal disease in children: a population-based case-control study in North America. *Pediatrics* 1999;103(3):28.
53. Gessner BD, Ussery XT, Parkinson AJ, Breiman RF. Risk factors for invasive disease caused by *Streptococcus pneumoniae* among Alaska native children younger than two years of age. *Pediatr Infect Dis J* 1995;14(2):123-128.
54. Pisacane A, Graziano L, Mazzarella G, Scarpellino B, Zona G. Breast-feeding and urinary tract infection. *J Pediatr* 1992;120(1):87-89.
55. Marild S, Jodal U, Hanson LA. Breastfeeding and urinary-tract infection (letter). *Lancet* 1990;336:942.
56. Lucas A, Cole TJ. Breast milk and neonatal necrotizing enterocolitis. *Lancet* 1990;336:1519-1523.
57. Kurscheid T, Holschneider AM. Necrotizing enterocolitis (NEC) mortality and long-term results. *Eur J Pediatr Surg* 1993;3:139-143.



58. Bernt KM, Walker WA. Human milk as a carrier of biochemical messages. *Acta Paediatr Suppl* 1999;430:27-41.
59. Istre GR, Conner JS, Broome CV, Hightower A, Hopkins RS. Risk factors for primary invasive *Haemophilus influenzae* disease: increased risk from day care attendance and school-aged household members. *J Pediatr* 1985;106(2):190-195.
60. Cochi SL, Fleming DW, Hightower AW, et al. Primary invasive *Haemophilus influenzae* type b disease: a population-based assessment of risk factors. *J Pediatr* 1986;108(6):887-896.
61. Takala AK, Eskola J, Palmgren J, et al. Risk factors of invasive *Haemophilus influenzae* type b disease among children in Finland. *J Pediatr* 1989;115(5):694-701.
62. Hahn-Zoric M, Fulconis F, Minoli I, et al. Antibody responses to parenteral and oral vaccines are impaired by conventional and low protein formulas as compared to breast-feeding. *Acta Paediatr Scand* 1990;79:1137-1142.
63. Pabst HF. Immunomodulation by breast-feeding. *Pediatr Infect Dis J* 1997;16(10):991-995.
64. Garofalo RP, Goldman AS. Expression of functional immunomodulatory and anti-inflammatory factors in human milk. *Clin Perinatol* 1999; 26(2):361-377.
65. Nafstad P, Jaakola JJK, Hagen JA, Botten G, Kongerud J. Breastfeeding, maternal smoking and lower respiratory tract infections. *Eur Respir J* 1996;9:2623-2629.
66. Picciano MF. Human milk: nutritional aspects of a dynamic food. *Biol Neonate* 1998;74:84-93.
67. Hernell O, Blackberg L. Human milk bile salt-stimulated lipase: functional and molecular aspects. *J Pediatr* 1994;125(5)(Pt 2):S56-S61.
68. Dewey KG. Growth characteristics of breast-fed compared to formula-fed infants. *Biol Neonate* 1998;74:94-105.
69. Meier PP, Brown LP, Hurst NM. Breastfeeding the preterm infant. Chapter 14 In Auerback K, Riordan J. *Breastfeeding*. Gaithersburg, MD: Aspen, 1998, pp. 449-480.
70. Von Kries R, Koletzko B, Sauerwald T, et al. Breast feeding and obesity: cross sectional study. *BMJ* 1999;319:147-150.
71. Ravelli AC, van der Meulen JHP, Osmond C, Barker DJP, Blekes OP. Infant feeding and adult glucose tolerance, lipid profile, blood pressure, and obesity. *Arch Dis Child* 2000;82(3):248-252.
72. Kramer MS. Do breast-feeding and delayed introduction of solid foods protect against subsequent obesity? *J Pediatr* 1981;98(6):883-887.
73. Strbak V, Skultetyova M, Hromadova M, Randuskova A, Macho L. Late effects of breast-feeding and early weaning: seven-year prospective study in children. *Endocrine Regulation* 1991;25:53-57.
74. Hamosh M. Does infant nutrition affect adiposity and cholesterol levels in the adult? *J Pediatr Gastroenterol Nutr* 1988;7(1):10-16.
75. Elliott KG, Kjolhede CL, Gournis E, Rasmussen KM. Duration of breastfeeding associated with obesity during adolescence. *Obes Res* 1997;5(6):538-541.
76. Oken E, Lightdale JR. Updates in pediatric nutrition. *Curr Opin Pediatr* 2000;12(3):282-290.
77. Centers for Disease Control and Prevention. *Pediatric Nutrition Surveillance, 1997 full report*. Atlanta: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 1998.
78. Perez-Bravo F, Carrasco E, Gutierrez-Lopez MD, Martinez MT, Lopez G, Garcia de los Rios M. Genetic predisposition and environmental factors leading to the development of insulin-dependent diabetes mellitus in Chilean children. *J Mol Med* 1996;74:105-109.
79. Gerstein HC. Cow's milk exposure and type 1 diabetes mellitus. *Diabetes Care* 1994;17(1):13-19.
80. Hammond-McKibben D, Dosch H-M. Cow's milk, bovine serum albumin, and IDDM: can we settle the controversies? *Diabetes Care* 1997;20(5):897-901.
81. Norris JM, Scott FW. A meta-analysis of infant diet and insulin-dependent diabetes mellitus: do biases play a role? *Epidemiology* 1996;7(1):87-92.
82. Pettitt DJ, Forman MR, Hanson RL, Knowler WC, Bonnett PH. Breastfeeding and incidence of non-insulin-dependent diabetes mellitus in Pima Indians. *Lancet* 1997;350:166-168.
83. Greco L, Auricchio S, Mayer M, Grimaldi M. Case control study on nutritional risk factors in celiac disease. *J Pediatr Gastro & Nutr* 1997;7(3): 395-399.
84. Auricchio S, Follo D, de Ritis, G, et al. Does breast feeding protect against the development of clinical symptoms of celiac disease in children? *J Pediatr Gastro & Nutr* 1983(3):2:428-433.
85. Falth-Magnusson K, Franzen L, Jansson G, Laurin P, Stenhammar L. Infant feeding history shows distinct differences between Swedish celiac and reference children. *Pediatr Allergy Immunol* 1996;7(3):1-5.
86. Ascher H, Krantz I, Rydberg L, Nordin P, Kristiansson B. Influence of infant feeding and gluten intake on celiac disease. *Arch Dis Child* 1997;76:113-117.
87. Ivarsson A, Persson LA, Nystrom L, et al. Epidemic of celiac disease in Swedish children. *Acta Paediatr* 2000;89:165-171.
88. Acheson ED, Truelove SC. Early weaning in the aetiology of ulcerative colitis: a study of feeding in infancy in cases and controls. *BMJ* 1961;2:929-933.
89. Whorwell PJ, Holdstock G, Whorwell GM, Wright R. Bottle feeding, early gastroenteritis, and inflammatory bowel disease. *BMJ* 1979;1:382.
90. Koletzko S, Sherman P, Corey M, Griffiths A, Smith C. Role of infant feeding practices in development of Crohn's disease in childhood. *BMJ* 1989;298:1617-1618.
91. Shu XO, Linet MS, Steinbuch M, et al. Breast-feeding and risk of childhood acute leukemia. *J Natl Cancer Inst*. 1999;91(20):1765-1772.
92. Smulevich VB; Solionova LG; Belyakova SV. Parental occupation and other factors and cancer risk in children: I. study methodology and non-occupational factors. *Int J Cancer* 1999;83:712-717.
93. Gilat T, Hacohen D, Lilos P, Langman MJS. Childhood factors in ulcerative colitis and Crohn's disease: an international cooperative study. *Scand J Gastroenterol* 1987;22:1009-1024.
94. Gruber M, Marshall JR, Zielezney M, Lance P. A case-control study to examine the influence of maternal perinatal behaviors on the incidence of Crohn's disease. *Gastroenterology Nursing* 1996;19(2):53-59.
95. Rigas A, Rigas B, Glassman M, et al. Breast-feeding and maternal smoking in the etiology of Crohn's disease and ulcerative colitis in childhood. *Ann Epidemiol*. 1993;3(4):387-392.
96. Saarinen UM, Kajosaari M. Breastfeeding as prophylaxis against atopic disease: prospective follow-up study until 17 years old. *Lancet* 1995;346:1065-1069.
97. Kramer MS. Does breastfeeding help protect against atopic disease? Biology, methodology, and a golden justice of controversy. *J Pediatr* 1988;112(2):181-190.
98. Oddy WH, Holt PG, Sly PD, et al. Association between breast feeding and asthma in 6 year old children: findings of a prospective birth cohort study. *BMJ* 1999;319:815-819.

99. Bjorksten B, Kjellman N-IM. Perinatal environmental factors influencing the development of allergy. *Clin Exper Allergy* 1990; 20 Suppl (3):3-8.
100. Burr ML, Limb ES, Maguire MJ, et al. Infant feeding, wheezing, and allergy: a prospective study. *Arch Dis Child* 1993;68:724-728.
101. Anderson EW, Johnstone BM, Remax DT. Breast-feeding and cognitive development: a meta-analysis. *A M J Clin Nutr* 1999;70: 525-535.
102. Jacobson SW, Chiodo LM, Jacobson JL. Breast-feeding effects on intelligence quotient in 4- and 11-year-old children. *Pediatrics* 1999;103(5):71.
103. Jensen RG. Lipids in human milk. *Lipids* 1999;34(12):1243-1271.
104. Lucas A, Morley R, Cole TJ, Lister G, Leeson-Payne C. Breast milk and subsequent intelligence quotient in children born preterm. *Lancet* 1992;339:261-264.
105. Jorgensen MH, Hernell O, Lund P, Holmer G, Michaelsen KF. Visual acuity and erythrocyte docosahexaenoic acid status in breast-fed and formula-fed term infants during the first four months of life. *Lipids* 1996;31(1):99-105.
106. Richards M, Wadsworth M, Rahimi-Foroushani A, Hardy R, Kuh D, Paul A. Infant nutrition and cognitive development in the first offspring of a national UK birth cohort. *Dev Med Child Neurol* 1998;40:163-167.
107. Hamosh M, Salem N. Long-chain polyunsaturated fatty acids. *Biol Neonate* 1998;74:106-120.
108. Heinig MJ, Dewey KG. Health effects of breast feeding for mothers: a critical review. *Nutrition Research Reviews* 1997;10:35-56.
109. McNeilly, AS. Lactational amenorrhea. *Endocrinol Metab Clin North Am* 1993;22 (1):59-73.
110. Kuzela AL, Stifter CA, Worobey J. Breastfeeding and mother-infant interactions. *J Reprod Infant Psychol* 1990;8:185-194.
111. Windstrom AM, Wahlberg V, Matthiesen AS, et al. Short-term effects of early suckling and touch of the nipple on maternal behavior. *Early Hum Dev* 1990;21:153-163.
112. Virden SF. The relationship between infant feeding method and maternal role adjustment. *J Nurs-Midwif* 1988;33(1):31-35.
113. Newcomb PA, Egan KM, Titus-Ernstoff L, et al. Lactation in relation to postmenopausal breast cancer. *Am J Epidemiol* 1999; 150:174-182.
114. Riordan JM. The cost of not breastfeeding: a commentary. *J Hum Lact* 1997;13(2):93-97.
115. Montgomery DL, Splett PL. Economic benefit of breast-feeding infants enrolled in WIC. *J Am Diet Assoc* 1997;97:379-385.
116. Hoey C, Ware JL. Economic advantages of breast-feeding in an HMO setting: a pilot study. *Am J Man Care* 1997;3(6):861-865.
117. U.S. Department of Commerce. Poverty 1998. Washington, DC: U.S. Department of Commerce, Census Bureau, 1999. [www.census.gov/hhes/poverty](http://www.census.gov/hhes/poverty).
118. Cohen R, Mrtek MB, Mrtek RG. Comparison of maternal absenteeism and infant illness rates among breast-feeding and formula-feeding women in two corporations. *Am J Health Promot* 1995;10(2):148-153.
119. Centers for Disease Control and Prevention. Public Health Service task force recommendations for the use of antiretroviral drugs in pregnant women infected with HIV-1 for maternal health and for reducing perinatal HIV-1 transmission in the United States. *MMWR* 1998(RR-2); 47:1-30.
120. American Academy of Pediatrics Committee on Pediatrics AIDS. Evaluation and medical treatment of the HIV-exposed infant (RE97-21). *Pediatrics* 1997;99(6):909-917.

121. American Academy of Pediatrics Committee on Pediatrics AIDS. Human milk, breastfeeding, and transmission of human immunodeficiency virus in the United States (RE9542). *Pediatrics* 1995; 96(5):977-979.
122. Lawrence, RA. A review of the medical benefits and contraindications to breastfeeding in the United States. *Maternal and Child Health Technical Information Bulletin*. Arlington, VA: National Center for Education in Maternal and Child Health, 1997, pp. 3-38.
123. American Academy of Pediatrics Committee on Environmental Health. Chapter 16. Human Milk. In *Handbook of Pediatric Environmental Health*. Elk Grove Village, IL: American Academy of Pediatrics, 1996, pp. 155-162.
124. Rogan WJ. Pollutants in breast milk. *Arch Pediatr Adolesc Med* 1996;150:981-990.
125. Environmental Protection Agency. Update: National Listing of Wildlife Advisories. Washington, DC: Environmental Protection Agency, 1998. <http://www.epa.gov/ost/fish>.
126. Centers for Disease Control and Prevention. Recommendations for prevention and control of hepatitis C virus (HCV) infection and HCV-related chronic disease. *MMWR* 1998;47(RR-19): 1-39. <http://www.cdc.gov/epo/mmwr/preview/mmwrhtml/00055154.htm>.
127. American Academy of Pediatrics Committee on Drugs. The transfer of drugs and other chemicals into human milk. *Pediatrics* 1994;93(1):137-150.
128. Wilton JM. Breastfeeding and the chemically dependent woman. *NAACOG's Clinical Issues* 1992;3(4):667-672.
129. The Institute of Medicine. Safety of Silicon Implants. Washington, DC: National Academy Press, 2000, pp. 248-263.
130. Neal P. Special feeds for special infants 2: feeding the preterm baby. *Prof Care Mother Child* 1995;5(6):151-155.
131. Motzfeldt K, Lilje R, Nylander G. Breastfeeding in phenylketonuria. *Acta Paediatr Suppl*. 1999; 432:25-27.
132. Mennella JA, Beauchamp GK. The transfer of alcohol to human milk. Effects on flavor and the infant's behavior. *N Engl J Med* 1991;325(14): 981-985.
133. Little RE, Anderson KW, Ervin CH, Worthington-Roberts B, Clarren SK. Maternal alcohol use during breast-feeding and infant mental and motor development at one year. *N Engl J Med* 1989;321(7):425-430.
134. Mennella JA, Beauchamp GK. Smoking and the flavor of breast milk. *Letter. N Engl J Med* 1998;339(21):1559-1560.
135. Freed GL, Clark SJ, Sorenson J, Lohr JA, Cefalo R, Curtis P. National assessment of physicians' breast-feeding knowledge, attitudes, training, and experience. *JAMA* 1995;273(6):472-476.
136. Freed GL, Clark SJ, Curtis P, Sorenson JR. Breast-feeding education and practice in family medicine. *J Fam Pract* 1995;40(3):263-269.
137. Freed GL, Clark SJ, Lohr JA and Sorenson JR. Pediatrician involvement in breast-feeding promotion: a national study of residents and practitioners. *Pediatrics* 1995;96(3):490-494.
138. Freed GL, Clark SJ, Cefalo RC, Sorenson JR. Breast-feeding education of obstetrics-gynecology residents and practitioners. *Am J Obstet Gynecol* 1995;173:1607-1613.
139. Schanler RJ, O'Connor KG, Lawrence RA. Pediatricians' practices and attitudes regarding breastfeeding promotion. *Pediatrics* 1999;103(3):35.



140. Dermer A. Overcoming medical and social barriers to breastfeeding. *American Family Physician* 1995;51:755-763.
141. Hawthorne K. Intention and reality in infant feeding. *Modern Midwife* 1994;25-28.
142. Gross SM, Caulfield LE, Bentley ME et al. Counseling and motivational videotapes increase duration of breast-feeding in African-American WIC participants who initiate breast-feeding. *J Am Diet Assoc* 1998;98(2):143-148.
143. Bentley ME, Caulfield LE, Gross SM, et al. Sources of influence on intention to breastfeed among African-American women at entry to WIC. *J Hum Lact* 1999;15(1):27-34.
144. Jolly R. Breastfeeding and health care services. *Int J of Gynecol Ob* 1990;31(S1):7-9.
145. Perez-Escamilla R, Pollitt E, Lonnerdal B, Dewey KG. Infant feeding policies in maternity wards and their effect on breast-feeding success: an analytical overview. *Am J Public Health* 1994;84(1):89-97.
146. WHO/UNICEF. *Protecting, Promoting and Supporting Breastfeeding: The Special Role of Maternity Services*. Geneva: World Health Organization, 1989. <http://www.unicef.org/newsline/tensteps.htm>.
147. World Health Organization. Evidence for the ten steps to successful breastfeeding. Geneva: WHO, 1998, pp. 1-5. Pub No. WHO/CHD 98.9.
148. UNICEF/WHO. *The UNICEF/Baby Friendly Hospital Initiative: Ten Steps to Successful Breastfeeding*. New York, NY: UNICEF, 1992.
149. Randolph L, Cooper L, Fonseca-Becker F, York M, McIntosh M. *Baby Friendly Hospital Initiative Feasibility Study: Final Report*. Healthy Mothers, Healthy Babies National Coalition Expert Working Group. Internal document. Washington DC: U.S. Department of Health and Human Services, 1994.
150. U.S. Department of Labor. *Women's Jobs: 1964-1999*. Washington, DC: U.S. Department of Labor, Women's Bureau, 1999. <http://www2.dol.gov/dol/wb/public/jobs6497.html>
151. Fein B, Roe B. The effect of work status on initiation and duration of breast-feeding. *Am J Public Health* 1998;88(7):1042-1046.
152. Roe B, Whittington LA, Fein SB, Teisl MF. Is there competition between breastfeeding and maternal employment? *Demography* 1999;36(2):157-171.
153. Bronner YL, Bentley M, Caulfield L, et al. Influence of work or school on breastfeeding among urban WIC participants. Abstracts of the 124th Annual Meeting of the American Public Health Association. New York, NY: American Public Health Association, 1996.
154. Gielen AC, Faden RR, O'Campo P, Brown H, Paige, DM. Maternal employment during the early postpartum period: effects on initiation and continuation of breast-feeding. *Pediatrics* 1991;87(3):298-305.
155. Hills-Bonczyk SG, Avery MD, Savik K, Potter S, Duckett LJ. Women's experiences with combining breast-feeding and employment. *J Nurse-Midwifery* 1993;38(5):257-266.
156. Bonoan R. Breastfeeding support at the workplace: best practices to promote health and productivity. *Family Health in Brief*. Washington, DC: Washington Business Group on Health, March 2000.
157. U.S. Department of Health and Human Services. *National Health and Safety Performance Standards: Guidelines for Out-of-Home Child Care Programs*. Arlington, VA: U.S. Department of Health and Human Services, Health Resources and Services Administration, Maternal and Child Health Bureau, 1992, pp. 117-120.

158. Baranowski T, Bee DE, Rassin DK, et al. Social support, social influence, ethnicity and the breast-feeding decision. *Soc Sci Med* 1983;17(21):1599-1611.
159. Cronenwett LR, Reinhardt R. Support and breast-feeding: a review. *Birth*, 1987; 14:199-203.
160. Grummer-Strawn LM, Rice SP, Dugas K, Clark LD, Benton-Davis S. An evaluation of breast-feeding promotion through peer counseling in Mississippi WIC clinics. *Maternal and Child Health Journal* 1997;(1)1:35-42.
161. Giugliani ERJ, Caiaffa WT, Vogelhut J, Witter FR, Perman JA. Effect of breastfeeding support from different sources on mothers' decisions to breastfeed. *J Hum Lact* 1994;10(3):157-161.
162. Bronner YL, Kessler L, Gross S, et al. Mother to mother breastfeeding peer counseling: a national WIC survey. Abstracts of the 122nd Annual Meeting and Exhibition, American Public Health Association, Public Health and Diversity: Opportunities for Equity. Washington, DC: American Public Health Association, 1994, p. 117.
163. U.S. Department of Agriculture. *Women, Infants, and Children National Breastfeeding Promotion Campaign*. [www.fns.usda.gov/wic/content/BF/brpromo/html](http://www.fns.usda.gov/wic/content/BF/brpromo/html).
164. Giugliani ERJ, Bronner Y, Caiaffa WT, Vogelhut J, Witter FR, Perman JA. Are fathers prepared to encourage their partners to breast-feed? A study about fathers' knowledge of breast-feeding. *Acta Paediatr* 1994;83:1127-1131.
165. Freed GI, Fraley JK, Schanler RJ. Attitudes of expectant fathers regarding breast-feeding. *Pediatrics* 1992;90(2):224-227.
166. Franklin DL, Wilson, WS. *Ensuring Inequality: The Structural Transformation of the African American Family*. New York, NY: Oxford University Press, Inc, 1997, pp. 1-288.
167. Ekulona E. Family health: taking responsibility/making the difference. In *The Healthy Start Father's Journal*. Baltimore, MD: Baltimore City Healthy Start, Inc, 1996, pp. 1-18.
168. Baumslag N. Breastfeeding, media: lessons learned. In Slussen W, Lange L, Shamez S (Eds). *Report of the National Breastfeeding Policy Conference*. Washington, DC: United States Breastfeeding Committee. UCLA Center for Healthier Children, Families and Communities, 1998, pp. 37-39.
169. Latham MC, Wiessinger MS. Marketing of breastmilk substitutes and obstacles to women's right to breastfeed. In Slussen W, Lange L, Shamez S (Eds). *Report of the National Breastfeeding Policy Conference*. Washington, DC: United States Breastfeeding Committee. UCLA Center for Healthier Children, Families and Communities, 1998, pp. 73-80.
170. Howard C, Howard F, Lawrence R, et al. Office prenatal formula advertising and its effect on breast-feeding patterns. *Obstet Gynecol* 2000;95(2):296-303.
171. Bergevin Y, Doughtry C, Kramer MS. Do infant formula samples shorten the duration of breast-feeding? *Lancet*, 1983;1(8334):1148-1151.
172. Powers NG, Naylor AJ, Wester RA. Hospital policies crucial to breastfeeding success. *Seminars in Perinatology* 1994;18(6):517-524.
173. World Health Organization. *International Code of Marketing of Breast-milk Substitutes*. Geneva: World Health Organization, 1981, pp. 5-7, 316-350.
174. United States Breastfeeding Committee. *Breastfeeding in the United States: Strategic Plan*. Arlington, VA: U.S. Department of Health and Human Services, Health Resources and Services Administration, Maternal and Child Health Bureau, 2000.



175. Kleinman RE (Ed). Pediatric Nutrition Handbook, 4th Edition. Elk Grove Village, IL: American Academy of Pediatrics, Committee on Nutrition, 1998.

## APPENDIXES

### Appendix 1: Environmental Pollutants That May Be Found in Human Milk <sup>123</sup>

Chemical Agent	Potential Health Effect
<ul style="list-style-type: none"> <li>• DDT, DDE</li> <li>• PCB/PCDF</li> <li>• TCDD (Dioxin)</li> <li>• Chlordane</li> <li>• Heptachlor</li> <li>• Hexachlorobenzene</li> </ul>	<ul style="list-style-type: none"> <li>• Estrogenic, antiandrogenic activity</li> <li>• Ectodermal defects, developmental delay</li> <li>• Chloracne</li> <li>• Neurotoxicity</li> <li>• Neurotoxicity</li> <li>• Hypotonia, seizures, rash</li> </ul>
<ul style="list-style-type: none"> <li>• Volatile organic compounds:               <ul style="list-style-type: none"> <li>Tetrachloroethylene</li> <li>Trichloroethylene</li> <li>Halothane</li> <li>Carbon disulfide</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Hepatotoxicity</li> <li>• Hepatotoxicity</li> <li>• Hepatotoxicity</li> <li>• Neurotoxicity</li> </ul>
<ul style="list-style-type: none"> <li>• Nicotine</li> </ul>	<ul style="list-style-type: none"> <li>• Neurotoxicity</li> </ul>
<ul style="list-style-type: none"> <li>• Metal:               <ul style="list-style-type: none"> <li>Lead</li> <li>Methyl mercury</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Renal, central nervous system injury</li> <li>• Central nervous system toxicity</li> </ul>

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**Appendix 2: Breastfeeding in the United States: Strategic Plan <sup>174</sup>**

<b>Goal 1</b>	<b>Assure access to comprehensive, current and culturally appropriate lactation care and services for all women, children, and families.</b>
Objective 1.1	Identify and disseminate evidence-based best practices and polices throughout the health care system.
Objective 1.2	Educate all health care providers and payers regarding appropriate breastfeeding and lactation support.
Objective 1.3	Ensure that all women have access to appropriate breastfeeding support within the family and/or community.
Objective 1.4	Ensure the routine collection and coordination of breastfeeding data by Federal, State, and local government and other organizations, and foster additional research of breastfeeding.
<b>Goal 2</b>	<b>Ensure that breastfeeding is recognized as the normal and preferred method of feeding infants and young children.</b>
Objective 2.1	Develop a positive and desirable image of breastfeeding for the American public.
Objective 2.2	Reduce the barriers to breastfeeding posed by the marketing of breast milk substitutes.
<b>Goal 3</b>	<b>Ensure that all Federal, State, and local laws relating to child welfare and family law recognize and support the importance and practice of breastfeeding.</b>
Objective 3.1	Ensure that all lawmakers and government officials at Federal, State, and local levels are aware of the importance of protecting, promoting, and supporting breastfeeding.
<b>Goal 4</b>	<b>Increase protection, promotion, and support for breastfeeding mothers in the work force.</b>
Objective 4.1	The rights of women in the workplace will be recognized in public and private sectors.
Objective 4.2	Ensure that all mothers are able to seamlessly integrate breastfeeding and employment.