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# Marketing Breastfeeding—Reversing Corporate Influence on Infant Feeding Practices

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**ABSTRACT** *Breast milk is the gold standard for infant nutrition and the only necessary food for the first 6 months of an infant's life. Infant formula is deficient and inferior to breast milk in meeting infants' nutritional needs. The infant formula industry has contributed to low rates of breastfeeding through various methods of marketing and advertising infant formula. Today, in New York City, although the majority of mothers initiate breastfeeding (~85%), a minority of infants is breastfed exclusively at 8 weeks postpartum (~25%). The article reviews the practices of the formula industry and the impact of these practices. It then presents the strategic approach taken by the NYC Department of Health and Mental Hygiene and its partners to change hospital practices and educate health care providers and the public on the benefits of breast milk, and provides lessons learned from these efforts to make breastfeeding the normative and usual method of infant feeding in New York City.*

**KEYWORDS** *Breastfeeding, Corporate influence, Infant, Nutrition, Infant feeding, Infant formula.*

## INTRODUCTION

Breast milk is the gold standard for infant nutrition and the only necessary food for the first 6 months of an infant's life. No formula preparation comes close to breast milk in meeting the nutritional needs of infants,[1] and yet over the past century, the formula industry has reversed feeding trends from primarily breastfeeding to formula feeding through pervasive marketing strategies targeting hospitals, health providers, and the general public. A coordinated and sustained multi-level strategy involving government, health care institutions and providers, communities, and workplaces is thus required to make breastfeeding once again the normative method of infant feeding.

Breast milk protects infants by reducing rates of infectious diseases,[2] sudden infant death syndrome (SIDS), several chronic and non-infectious illnesses,[2] and postneonatal infant death.[2] Breastfeeding also offers mothers considerable postpartum and long-term health benefits.[2]

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**TABLE 1. Breastfeeding (BF) rates by demographic factors, USA and NYC[a, b]**

| | USA, 2005[c] | | | | NYC, 2004–2005[d] | | | |
|---|---|---|---|---|---|---|---|---|
| | Initiated BF | | Exclusive BF at 3 months | | Initiated BF | | Exclusive BF at 2 months | |
| | % | 95% CI | % | 95% CI | % | 95% CI | % | 95% CI |
| Maternal education | | | | | | | | |
| <High School | 63.6 | 61.0–66.2 | 33.6 | 30.9–36.3 | 80.4 | 74.6–85.2 | 24.9 | 19.2–31.5 |
| High School Graduate | 64.8 | 63.0–66.6 | 30.6 | 28.8–32.4 | 81.0 | 76.4–84.9 | 23.4 | 19.0–28.4 |
| Some College | 76.8 | 74.9–78.7 | 39.5 | 37.2–41.8 | 85.0 | 79.7–89.2 | 23.8 | 18.6–29.9 |
| College Graduate | 85.5 | 84.6–86.4 | 49.3 | 48.0–50.6 | 90.7 | 86.8–93.5 | 32.7 | 27.6–38.2 |
| Poverty income ratio, % | | | | | | | | |
| <100% | 63.5 | 61.2–65.8 | 31.7 | 29.4–34.0 | | Not available | | Not available |
| 100–184% | 70.8 | 68.7–72.9 | 36.7 | 34.3–39.1 | | Not available | | Not available |
| 185–349% | 73.6 | 71.7–75.5 | 38.9 | 36.9–40.9 | | Not available | | Not available |
| >=350% | 82.4 | 81.2–83.6 | 46.0 | 44.4–47.6 | | Not available | | Not available |
| Race/ethnicity | | | | | | | | |
| Non-Hispanic black | 55.4 | 52.9–57.9 | 26.8 | 24.5–29.1 | 80.4 | 75.1–84.8 | 19.0 | 14.5–24.4 |
| Non-Hispanic white | 74.1 | 73.0–75.2 | 39.3 | 38.1–40.5 | 85.3 | 80.8–88.9 | 33.9 | 28.7–39.5 |
| Hispanic or Latino | 79.0 | 77.3–80.7 | 43.9 | 41.7–46.1 | 87.0 | 83.3–90.0 | 26.0 | 21.8–30.8 |
| Asian or Pacific Islander | 81.4 | 78.5–84.3 | 43.1 | 39.2–47.0 | 80.8 | 71.2–87.5 | 22.0 | 15.1–31.0 |
| Nativity | | | | | | | | |
| US born | | Not available | | Not available | 79.5 | 75.5–83.0 | 23.5 | 19.8–27.6 |
| Foreign born | | Not available | | Not available | 87.9 | 85.0–90.3 | 28.6 | 25.0–32.5 |

[a]Exclusive breastfeeding data was measured at 3 months postpartum for US survey and 2 months postpartum for NYC survey.
[b]Values with non-overlapping confidence intervals are significantly different at the $p<0.05$ level.
[c]Data from 2005 National Immunization Survey, Centers for Disease Control and Prevention, Department of Health and Human Services.[5]
[d]Data from NYC PRAMS, 2004–2005 births.[7]

The American Academy of Pediatrics (AAP) and other leading medical societies and institutions recommend exclusive breastfeeding—meaning that the infant consumes human milk only—for the first 6 months of life.[2] Exclusive breastfeeding, compared to some breastfeeding, is associated with improved disease protection and longer duration.[2] Key practices to promote exclusive breastfeeding include the elimination of hospital policies and practices that discourage breastfeeding, such as unnecessary supplemental feeding, infant formula discharge packs and formula discount coupons, separation of mother and infant, and lack of adequate encouragement and support of breastfeeding.[2]

The infant formula industry has had a significant adverse impact on breastfeeding rates through strategic marketing, targeting women with direct advertising and with the implicit and explicit endorsement of health providers. Public health agencies, however, can and should work to counter this corporate influence by creative and aggressive breastfeeding promotion, utilizing the same channels that have been leveraged by formula manufacturers. Accordingly, the New York City Department of Health and Mental Hygiene has launched a multi-level strategy to increase rates of exclusive breastfeeding and prolong breastfeeding duration and ultimately make breastfeeding the feeding method of choice. Strong leadership, effective partnerships, and dedicated resources have been identified as critical components to a successful initiative.

## CURRENT TRENDS IN INFANT FEEDING

In 2005, 71% of US women initiated breastfeeding, and by 3 months, only 38% were exclusively breastfeeding.[3] There were significant disparities, with lower rates of initiation and exclusive breastfeeding among women living below the poverty level, with less than a high school education, and among non-Hispanic Blacks (see Table 1).[3] In New York City, Black babies born in lower-income neighborhoods are already a more vulnerable population, being the racial/ethnic group most at risk for low birthweight and infant mortality.[4]

Compared to national figures, data from the New York City Pregnancy Risk Assessment Monitoring System (PRAMS)[5] survey from 2004–2005 reflect higher breastfeeding initiation (any breastfeeding) with 84.3% of NYC women initiating, with no significant difference by age or insurance status. While there were some racial/ethnic differences, the most significant difference was by country of birth, with 87.9% of foreign-born mothers initiating breastfeeding, compared to 79.5% of US-born mothers (see Table 1).[5]

Despite initiation rates that exceed national averages, NYC PRAMS data show a sharp decline in breastfeeding in the first 2 months of the infant's life, with only 26.4% of women reporting exclusive breastfeeding and 61.4% reporting at least some breastfeeding at eight weeks postpartum. Mothers' leading reasons for discontinuation were: concerns that their milk production was insufficient (45%) and that breast milk did not satisfy the baby (42%); baby had difficult nursing (24%); sore, cracked or bleeding nipples (17%); and mother went back to work or school (16%).[5]

## US INFANT FORMULA MARKETING: FROM PAST TO PRESENT

When infant formula was introduced to the USA in the late 1860s, manufacturers advertised their new product directly to consumers in women's magazines.[6] Advertisements implied that babies needed more than just breast milk to achieve optimal health and nourishment, and they emphasized how closely formula approximated breast milk's chemical composition.[6] As is still done today, formula companies attracted new customers with free samples and information on infant feeding and care.[6]

From the early twentieth century until the late 1980s, most formula companies abandoned direct-to-consumer advertising and used the medical community as their sole advertising vehicle.[7] In lieu of directions on how to prepare the formula and recommended dosages, formula package instructions advised mothers to obtain formula feeding guidance at regular doctor visits—yielding a steady flow of income for physicians.[8] Formula companies further engendered physicians' goodwill by sponsoring scientific conferences and research on infant nutrition.[7] Doctors retained their role as undisputed advisors on infant health and feeding while simultaneously providing product referrals for formula purchase and serving as an advertising source of unparalleled credibility.

In the late 1960s formula companies' marketing tactics sparked international opposition, rooted in the assertion that formula promotion in developing countries caused preventable infant deaths.[9–12] Following this controversy, in the late 1970s, WHO and UNICEF led the development of the International Code of Marketing of Breastmilk Substitutes, a nonbinding public health recommendation prohibiting the unethical marketing of formula, including the promotion of formula as superior to breast milk, and the advertising and/or provision of free samples to pregnant women, new mothers, and health facilities.[13] The Code was adopted by the World Health Assembly in 1981 and refined in subsequent years.[13] The USA was the only Member State to vote against it, only endorsing it in 1994.[13]

The Code entrusts governments to regulate what information, education, and equipment women, health care providers, and others in their countries receive on breastfeeding and formula, and there is no mechanism for international enforcement.[13,14] A 1998 report from the International Baby Food Action Network (IBFAN) surveyed 31 countries and found that most were not compliant with the Code;[15] a 2004 IBFAN report noted that most of the marketing practices employed by 16 international baby food manufacturers and 14 bottle and nipple companies violated the Code.[16] The USA has never enforced the Code with any legislation or regulatory action.[17]

In 1989, the first-ever infant formula television commercial was aired,[7,18] initiating a new wave of formula marketing that targets consumers directly. The AAP and the American Medical Association (AMA) have formally expressed their opposition to direct-to-consumer advertising of formula, but many health institutions continue to play a key role in infant formula promotion.[7] Formula companies give hospitals and medical providers free or discounted products, and they encourage health workers to recommend their brands. Most US hospitals provide discharge packs containing free formula to mothers when they leave the hospital.[19]

Since the early 1990s, infant formula manufacturers have supplied obstetricians' offices with infant feeding education packs containing formula samples, discount coupons, and business reply cards redeemable for free cases of formula.[20] In a survey at a hospital in Rochester, New York, 78% of women who received printed

**TABLE 2 Summary of study findings on the impact of formula promotion on breastfeeding**

| Study | Study population | Intervention | Result highlights[a] | Conclusions |
|---|---|---|---|---|
| (1) Office Prenatal Formula Advertising (Year of publication: 2000)[20] | 547 women presenting for first prenatal visit at six obstetric care sites in Rochester, NY (95% white, 99% privately insured, 86% married) | Randomized Controlled Trial—Participants randomized to receive educational packs that were either "commercial" (formula company produced) or "non-commercial" (without any formula promotion content) on infant feeding at the first prenatal visit | Commercial group participants were more likely to cease breastfeeding before hospital discharge (RR 5.80, $P=0.02$), and before 2 weeks (adjusted OR 1.91, $P=0.04$).<br>Compared to the control, commercial group participants who were uncertain how long they wanted to breastfeed or with goals of ≤12 weeks had shortened rates of exclusive (hazard ratio 1.53) and overall (hazard ratio 1.75) breastfeeding duration. | Exposing women to formula promotion materials in the prenatal period significantly increases the risk of breastfeeding cessation in the first 2 weeks postpartum. |
| (2) Hospital postpartum counseling and discharge pack contents (Year of publication: 1987)[30] | 343 women who delivered at Boston City Hospital during a 17-month recruitment period (65% Black, 69% < 100% of poverty, 49% married) | Randomized Controlled Trial—all participants randomly assigned to one of four treatment groups: (1) routine counseling + commercial discharge pack; (2) routine counseling + research discharge pack; (3) Research counseling + commercial discharge pack; (4) Research counseling + research discharge pack | Research discharge pack recipients breastfed exclusively for an average of 18 days longer than commercial discharge pack recipients during the first 4 months postpartum ($P=0.004$).<br>Research discharge pack recipients were significantly more likely than other recipients to be at least partially breastfeeding at 4 months postpartum ($P=.04$). | Commercial discharge packs may threaten to inhibit breastfeeding duration among high-risk populations.<br>Positive effects of commercial discharge packs on infant-feeding practices or infant health had not been identified in any study to date at the time of publication. |

**TABLE 2** ***Continued***

| Study | Study population | Intervention | Result highlights[a] | Conclusions |
|---|---|---|---|---|
| (3) Prospective study of breastfeeding mothers (Year of publication: 1986)[34] | 166 mothers at Chicago Lying-in Hospital (78% Black, 35% received public assistance, 65% married) | (1) Double-blind controlled study; (2) prospective, observational study<br>All mothers who stated a plan to breastfeed received a 30-minute individual breastfeeding teaching session and noncommercial breastfeeding education materials, and were randomly assigned to receive a discharge pack with or without formula. | The type of discharge packs did not demonstrate any significant effect on the percent of mothers breastfeeding postpartum.<br>At 4 weeks, 96% of infants who had received less than 1 bottle of formula per day on average in the hospital were still breastfeeding, compared to 68% of infants who received more than an average of 4 formula bottles per day ($P<0.05$); This gap widened at 10 weeks (96% versus 44%, $P<0.01$) and 16 weeks (74% versus 20%, $P<0.05$). | While discharge packs containing formula did not impact on breastfeeding initiation or continuation in this study, formula supplementation at the hospital did, and results were statistically significant. |
| (4) Hospital discharge packs (Year of publication: 1997)[35] | 1,625 women who delivered at a Western US regional tertiary level hospital during a 14-month recruitment period (80% white, 11% Hispanic, 6% Black, 45% Medicaid, 74% married | Randomized controlled trial<br>During randomly assigned weeks, all breastfeeding mothers received a discharge bag containing one of following items:<br>(1) formula (2) breast pump (3) formula and breast pump (4) no formula and no breast pump | The discharge packs did not have any overall effect on feeding method or breastfeeding duration.<br>Receipt of formula was associated with less exclusive breastfeeding at 6 weeks postpartum among the following subgroups: mothers who intended to breastfeed for at least 6 months (64.1% of formula-only recipients fully breastfeeding versus 78.4% of pump-only recipients, $P<0.05$); mothers who had not returned to work or school by 6 weeks (57.1% of formula-only recipients fully breastfeeding versus 62.0% of pump-only recipients, $P<0.05$) | Providing formula in discharge pack can encourage early use of formula but does not affect breastfeeding duration.<br>Hospital had instituted Baby-Friendly practices, which may have lessened effect of formula in discharge pack.<br>Results may have been minimized due to an under-representation of minority and low income women, who often have lower rates of breastfeeding. |

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| (5) WIC-based Interventions to increase breastfeeding initiation and continuation (year of publication: 1998)[36] | 242 women presenting at 4 WIC Centers in Baltimore, Maryland (100% African-American; 100% WIC enrolled; 82–89% single) | Randomized controlled trial—four clinics matched on breastfeeding rates and client ethnicity were assigned to interventions testing the effect of a breastfeeding promotion video and/or peer counseling. All participants were interviewed at 7–10 days postpartum on hospital practices associated with breastfeeding initiation and duration.[b] | Women who received formula discharge packs at the hospital were significantly less likely to initiate breastfeeding (OR.22, P<.05) and to be breastfeeding at 7–10 days postpartum (OR.17, P<.05).<br>Women who received infant feeding instructions at the hospital were significantly more likely to initiate breastfeeding (OR 2.01, P<.05) and to be breastfeeding at 7–10 days postpartum (OR.22, P<.05). | Hospital practices, including giving women infant feeding instructions and formula discharge packs, have a demonstrable effect on breastfeeding initiation and continuation. |
| (6) Formula Samples at Hospital Discharge to breastfeeding mothers (Year of publication: 1992)[37] | 88 breastfeeding women who delivered at Irvine Medical Center in California.<br>100% Hispanic (Spanish speaking)<br>100% Low income (mean yearly income < $7700 in 1989–90)<br>71–76% Married or living with partner | Randomized controlled trial<br>During three randomly assigned two-week time blocks, all breastfeeding mothers received a commercial formula gift pack. (For the control, breastfeeding mothers did not receive gift packs during the other three randomly assigned time blocks of the study period.) | At three weeks postpartum, women who received formula gift packs were significantly less likely to be exclusively breastfeeding - 33% vs. 68% (P<.004), and all were giving bottles to their babies (P<.004).<br>No relationship was found between receipt of a formula gift pack at hospital discharge and likelihood of exclusive breastfeeding at one week postpartum. | Giving breastfeeding women formula gift packs at hospital discharge is associated with a decrease in exclusive breastfeeding at three weeks postpartum. |

**TABLE 2** ***Continued***

| Study | Study population | Intervention | Result highlights[a] | Conclusions |
|---|---|---|---|---|
| (7) The effect of hospital practices on breastfeeding duration (Year of publication: 1996)[38] | 584 women who delivered at University Medical Center in Tucson, Arizona during a 1-month baseline study and during a three-month post-intervention evaluation (~69% Native English speakers; 34–40% on WIC; 64–65% married) | Pre-/post-intervention evaluation—The hospital changed its policies and practices to support, protect and promote breastfeeding. Interviews were attempted for all women who delivered during a 1-month baseline study and three years later during a 3-month post-intervention evaluation, to assess their own and the hospital's infant feeding practices. | Women were significantly *less* likely to be exclusively (37.3% vs. 68.2%, $P < 0.0001$), or partially breastfeeding at one month (77.3% vs. 89.6%, $P<0.01$) and 4 months ($P<0.01$ for both) if their infants were given formula while in the hospital<br>Women were significantly *less* likely to be breastfeeding at 1 month postpartum if they were given hospital discharge packs with formula or formula coupons −78.7% vs. 90.8% ($P<0.01$).<br>Women were significantly *more* likely to be exclusively breastfeeding at four months if they were given hospital discharge packs without formula or coupons ($P<0.05$): OR 1.62 (1.02–2.57) | Providing mothers with hospital discharge packs containing formula or coupons can have a significant negative impact on breastfeeding duration. |
| (8) Factors associated with a substantial decline in breastfeeding rates in a group of recent immigrants (Year of publication: 1989)[39] | 134 women and 348 children in a northern California city; 100% Indochinese refugees (Hmong—51%, Cambodian—32%, Laotian—17%) with one or more infants born in their native country, and one or more infants born in the US; most on welfare | Retrospective cohort study—Indochinese mothers were interviewed on the infant feeding practices they employed with their last Indochina-born and first and last US-born children. | Mothers were significantly more likely to feed their infant formula if they were given formula samples when discharged from the hospital (OR 2.02; $P=0.05$).<br>No association was identified between breastfeeding or formula feeding and any other independent variable. | This study has similar findings to others on the decrease in breastfeeding follow emigration to the USA for some immigrant groups<br><br>Although the only statistically significant finding was associated with the provision of formula at hospital discharge, it is possible that other cultural and social factors contributed to a significant post-emigration decrease in this population's breastfeeding rates. |

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| (9) Effect of contents of hospital discharge packs on breastfeeding duration (Year of publication: 1997) [40] | 763 women who delivered at private community hospital in Iowa (96% White; 9% < $10,000 yearly income, 44% ≥ $40,000; 85% married) | Randomized controlled trial—all breastfeeding mothers who volunteered to participate were randomly assigned to receive a discharge pack containing one of the following options: (1) manual breast pump; (2) manual breast pump + formula (3) infant formula | None of the discharge packs distributed to the study groups demonstrated a statistically significant ($P<0.05$) impact on overall breastfeeding duration rates.<br>Receipt of a discharge pack with formula was associated with a higher percentage of women exclusively breastfeeding, as compared to receipt of a manual breast pump (P<.01): at week 2, 88.3% of women who received formula were exclusively breastfeeding versus 72.1% of women who received a pump. The gap continued at 4 weeks (64.9% versus 55.4%), 6 weeks (53.9% versus 43.8%) and 8 weeks (45.3% versus 37.9%). | Hospital discharge packs with formula were not associated with changes in breastfeeding duration.<br>More widespread breastfeeding promotion may have created an "inoculation effect" that rendered women less vulnerable to the influence of discharge pack contents.<br>Women lost to follow-up were significantly different from other study participants—more likely to be low-income, less educated, unemployed, enrolled in WIC, unmarried, minority—which raises concerns about the generalizability of this study, in particular to urban populations. |
| (10) Effect of hospital gift packs on breastfeeding duration among adolescents (year of publication: 1988) [41] | 60 first-time adolescent mothers < 18 years of age; a subset of teens who gave birth at University Hospital in Denver, Colorado during the study period (no other demographic information described in article). | Randomized prospective study—60 first-time teen mothers who had breastfed their infants at least once postpartum were randomized to receive either a commercial hospital discharge pack with formula, or a study discharge pack with items to support breastfeeding and no formula | Receipt of hospital discharge packs with formula did not demonstrate any significant impact on breastfeeding duration or on the age at which infants were introduced to formula. | The contents of the hospital discharge pack did not have an effect on breastfeeding duration among these adolescent mothers. |

**TABLE 2** ***Continued***

| Study | Study population | Intervention | Result highlights[a] | Conclusions |
|---|---|---|---|---|
| (11) Effect of demographic characteristics and hospital practices on breastfeeding patterns (year of publication: 1990)[42] | 20,619 randomly selected mothers who responded to a national questionnaire administered by Ross Laboratories at 6 months postpartum | Survey recipients responded to questions about their own and their delivery hospitals' infant feeding practices | Mothers who were partially breastfeeding in the hospital were more likely to have received an infant formula discharge kit than mothers who were exclusively breastfeeding in the hospital (90% versus 82%, $P<0.005$).<br>Among mothers who breastfed exclusively in the hospital, those who had received a formula discharge kit were more likely to switch to partial breastfeeding by the first month (OR: 1.37; 95% CI: 1.14–1.72).<br>Among mothers who breastfed either exclusively or partially in the hospital, those who did not receive breastfeeding instructions were significantly more likely to discontinue breastfeeding by the first month (OR: 1.93, 95% CI: 1.53–2.45). | Receipt of a formula discharge kit had a small but statistically significant effect on the switch from exclusive to partial breastfeeding at 1 month postpartum. Receipt of breastfeeding instructions had an impact on mothers who did any breastfeeding in the hospital. |
| (12) Effect of providing infant formula samples at hospital discharge on breastfeeding practices (year of publication 1986)[43] | 95 women delivering at University Hospital in Seattle, Washington who were breastfeeding at hospital discharge (83% White; 1% Married). No data provided on socio-economic status; however mean years of education were 12.8 | Randomized controlled trial—subjects were randomly assigned to either have formula included in a discharge pack, or no formula in the pack. The other contents of the discharge pack were the same for all subjects. | Receipt of hospital discharge packs with formula did not demonstrate any significant impact on breastfeeding duration or on the age at which infants were introduced to formula. | Including formula in hospital discharge packs did not significantly affect breastfeeding practices in this study. |

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| (13) Commercial Hospital Discharge Packs (CHDP; Year of publication: 2008)[29] | 2,684 randomly selected postpartum women surveyed through the Pregnancy Risk Assessment Monitoring System in Oregon from 2000–2001 (37% White, 23% Hispanic, 18% Asian/PI, 12% Amer. Indian/Alaska native, 11% Black; 63% married; 42% family income > $30,000). | Cross-sectional study—Examined the effect of receipt of CHDP, by mothers who initiated breastfeeding, on rates of exclusive and non-exclusive breastfeeding at 10 weeks postpartum. | 66.8% of respondents who initiated breastfeeding reported receipt of CHDP<br>After adjusting for maternal age, race/ethnicity, education and family income, women who received a CHDP were more likely to exclusively BF for less than 10 weeks than women who did not receive a CHDP (AOR=1.39; CI=1.05, 1.84). CHDPs did not have a significant effect on nonexclusive breastfeeding for at least 10 weeks. | Receipt of commercial hospital discharge packs by new mothers who initiated breastfeeding was associated with shorter duration of exclusive breastfeeding. |

[a]All results reported are statistically significant unless stated otherwise. The results included in this table are limited to those that describe the impact of formula promotion (via health institutions) on breastfeeding initiation and duration.
[b]A pre-study review of standard hospital practices at the delivery sites provided limited verification of participants' recall.

information on infant feeding reported that a formula company had published it, and 65% stated they had received free formula offers during their pregnancy.[21] In a survey of Monroe County, New York obstetricians, the majority of respondents stated that they recommended breastfeeding and provided breastfeeding support postpartum, but many also indirectly promoted infant formula by dispensing free formula offers and literature produced by formula companies.[22]

The US Department of Agriculture's (USDA) Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) purchases over half of all infant formula consumed in the USA and provides it free to enrolled mothers, all of whom have incomes less than or equal to 185% of the Poverty Income Guidelines.[23,24] Although breastfeeding promotion is part of WIC's mandated work,[25] formula companies have leveraged WIC as a promotional vehicle. In each state, one formula manufacturer gives WIC significant price rebates in exchange for exclusive rights to provide its brand of formula to all WIC participants in the state. The rebate money constitutes a substantial portion of WIC's budget, and it can only be used to expand the program's reach—thereby providing a broader consumer base of potential formula purchasers.[24] Many states violate the USDA's Food and Nutrition Service restrictions by allowing formula manufacturers to use the trademarked WIC acronym in their printed materials—often specifying them as "WIC approved" and/or "WIC eligible", thereby implying a WIC endorsement of their products.[19]

## THE IMPACT OF FORMULA MARKETING ON BREASTFEEDING

Institutional practices, implemented in the setting of marketing by the formula industry, are pervasive in three phases of perinatal care associated with reduced rates of breastfeeding initiation, duration and exclusivity: providing women in prenatal care with formula company-produced infant feeding information and free formula offers; giving mothers free formula at hospital discharge; and hospitals' non-medically indicated use of formula with breastfeeding infants.

Most women decide how they will feed their baby by the last trimester of pregnancy.[26] Information given during prenatal care is extremely influential, and it is well documented that both advertising and provider attitudes influence women's choice of infant-feeding methods.[26]

Formula promotion materials are designed to sell formula to as many mothers as possible. The sooner a mother phases out breastfeeding, the more formula is purchased—creating an incentive for formula companies to undermine breastfeeding even as they state its benefits. Accordingly, although information on breastfeeding is usually included in these materials, the messages are mixed at best and emphasize the challenges of breastfeeding.[27] A health provider who distributes materials that are ultimately designed to maximize formula sales is inadvertently strengthening the formula promotion message, potentially at the expense of patients' plans to breastfeed.[20,28]

In a randomized controlled trial studying the impact of educational packs on infant feeding, women who received formula company-produced infant feeding materials at their first prenatal visit were more likely than those who received noncommercial materials to stop breastfeeding before hospital discharge and before 2 weeks postpartum. Women with an uncertain decision to breastfeed, or with a plan to breastfeed 12 weeks or less, who received the commercial materials also had notably lower rates of exclusive breastfeeding and overall duration.[20]

In 11 studies selected for review by the US Government Accountability Office (GAO), seven found that for at least one point in time, breastfeeding rates were lower among women who received formula company-produced discharge packs and/or formula or formula coupons from hospitals, as compared to women who received non-commercial packs or no packs at all.[19] Of the three studies that found no impact of formula promotion on infant feeding practices, two had a study population predominantly comprised of groups that have significantly higher breastfeeding initiation and duration rates. Other studies have also found decreased breastfeeding initiation and duration rates associated with the distribution of free commercial formula, especially among first-time, less educated and ill mothers (see Table 2 for summary of studies referenced above).[19,20,24,25,29]

Conversely, inclusion of items useful for breastfeeding in discharge materials may significantly prolong breastfeeding compared to the effect of formula company-produced discharge packs. A randomized controlled trial conducted at a municipal institution serving medically indigent inner-city women in Boston demonstrated that compared to women who received a commercial pack, women who received a research pack designed to be consistent with the WHO Code of Marketing of Breast Milk Substitutes had longer periods of exclusive and partial breastfeeding at 4 months postpartum (both statistically significant; see Table 2).[30]

Hospitals that routinely use early formula supplementation can also diminish breastfeeding duration. Administering bottles to breastfeeding infants, particularly when breastfeeding is first being established, reduces infants' sucking on the breast, prompting a physiologic inhibition of milk secretion. This practice can also undermine breastfeeding by suggesting to the mother that her breast milk is insufficient to meet the baby's nutritional needs.[26]

A generalized social preference for formula-feeding over breastfeeding in the USA, created and reinforced by practices described above, also contributes to infant feeding decisions, as was articulated in a focus group of Latina women in NYC's South Bronx.[31] Focus group participants stated:

> "It is not easy to breastfeed or pump when you work. It is easier to get the milk [(formula)] from WIC…and family members can help you with feeding."
>
> "Not too many women on television breastfeed their babies."
>
> "The message they are sending is to bottle-feed – there are a whole bunch of bottles that are out there—ones that look like your nipple, ones with characters like Mickey Mouse, bottles to stop gas. There is less information on the breast milk."[31]

Breastfeeding is more time consuming than formula feeding, and can initially be challenging even for mothers who are determined to breastfeed. These and other factors, such as inconsistent and insufficient support for breastfeeding and easy access to and high visibility of formula feeding, all contribute to high rates of early breastfeeding discontinuation among NYC women.

## NYC RESPONSE TO FORMULA PROMOTION

Adequate food and nutrition are basic human rights. The widespread promotion of infant formula, which provides suboptimal infant nourishment, and lack of community, institutional, and government support for breastfeeding, all undermine

this right. Public health agencies and government partners should institute policies and interventions that support breastfeeding, especially in light of undermining corporate influences. These include "advertising" breastfeeding through the channels that the formula companies have used to promote their products, and helping women to access services and other support that will help them initiate and continue breastfeeding. An effective intervention must tackle breastfeeding barriers at the individual, institutional, community and policy levels; creating needed resources where they do not already exist.

In recognition of these factors, the New York City Department of Health and Mental Hygiene (DOHMH) developed a citywide multilevel breastfeeding promotion strategy. The goal is to make breastfeeding a normative, expected, and supported behavior by raising awareness, providing local resources and support, changing systems that interface with pregnant and parenting women and their families, and advocating for policy changes that support breastfeeding, especially for working and low-income women who face the greatest barriers. DOHMH's multi-level strategy has three focal areas: (1) individual-level change, (2) institutional- and community-level change, (3) and policy change. Highlights of this work are presented below.

1. Individual-level change: DOHMH's breastfeeding promotion at the individual level focuses on provider and client/family education.

   (a) Provider education: In May 2007 DOHMH trained 50 providers from its own staff and from the public hospital system (Health and Hospitals Corporation) as Certified Lactation Coordinators (CLCs), increasing the capacity of both agencies to provide skilled support to breastfeeding women. Four more courses will train 200 additional providers in 2008.
   DOHMH conducts Grand Rounds and trainings for hospital staff and other health care providers. The Breastfeeding Promotion Leadership Committee, a citywide group co-chaired by DOHMH and New York State Department of Health, has hosted annual provider conferences and Continuing Medical Education dinner meetings. A *City Health Information* publication detailing breastfeeding information for providers was issued in March 2008.[32]

   (b) Client/Family Education: DOHMH's Newborn Home Visiting Program employs outreach workers to conduct home visits to newborns in communities with the poorest health outcomes, and through a recent expansion will visit more than 8,000 newborns annually. In 2007, the program added an enhanced breastfeeding support component to visit breastfeeding mothers within days of hospital discharge and again 1 week later. The paraprofessional staff have been trained as CLCs and are backed up by a registered nurse.
   DOHMH supports the nation's largest urban site of the Nurse–Family Partnership (NFP), a national, evidence-based home visiting program for low-income first-time mothers. Nurses visit women regularly from pregnancy until the baby is 2 years old. The NYC NFP currently serves over 1,000 families and will grow to over 2,600 in the next year. Breastfeeding is a major focus of NFP, and in data from program inception through December 2007, 89.3% of NFP mothers initiated breastfeeding, and 34.4% were still breastfeeding at 6 months.[33]

2. Institutional/Community Level Change: Efforts to promote breastfeeding at the institutional and community levels target communities, hospitals and workplaces.

   (a) Community interventions: DOHMH creates and disseminates free multimedia educational materials for mothers on breastfeeding support, guidance and rights. Materials include images of breastfeeding mothers to showcase breastfeeding as a normative and socially acceptable activity and to provide visual guidance for correct breastfeeding techniques.
   (b) Baby-Friendly/Breastfeeding Friendly Hospitals: In December 2006, DOHMH provided NYC's Health and Hospitals Corporation (HHC) with $2 million and on-going technical assistance to implement a 2-year breastfeeding initiative throughout its 11 public hospitals. The initiative's goals are 80% of mothers breastfeeding at discharge, and an increase in breastfeeding duration and exclusive breastfeeding. The initiative objectives include the following: standardized provider training; no patient, provider, or institution incentives from formula companies, including gift packs and advertisements; no formula representative contact with patients in the hospitals; rooming-in (mothers and infants in the same room) for 24 h a day; early latching, i.e., breastfeeding initiated within 1 h of delivery and immediate mother-to-child skin-to-skin contact at the time of birth; no artificial feeding, including formula, water, nipples, or pacifiers, while in the hospital or upon discharge unless medically indicated; and the provision of hospital discharge gift packs that are specially designed to promote and support breastfeeding.

      HHC has established a breastfeeding policy and guidelines for its hospitals, with accountability for implementation and compliance with the policy at the highest administrative and clinical levels of management. A citywide Breastfeeding Director and Administrator have been hired to oversee this initiative, and each member hospital has hired a Breastfeeding Coordinator. A program evaluation will track the impact of the initiative on breastfeeding initiation, duration, and exclusivity.

   (c) Breastfeeding-Friendly Workplaces: In 2007 DOHMH launched the first lactation room and breast pump loan program for its employees and instituted workplace policies that support breastfeeding mothers, including breaks to pump during the work day. The program guidelines will serve as a template for other NYC businesses seeking to implement similar support for breastfeeding employees.

3. Policy Level Change

Local, state and federal policy changes are essential to increase breastfeeding rates in NYC. DOHMH has provided input and advocacy for a proposed Breastfeeding Bill of Rights and for other key policies that would support breastfeeding, including required workplace support for breastfeeding mothers, a routine nurse home visit for all breastfeeding mothers within 48 h of hospital discharge, a routine pediatric visit within 1 week of birth, increased funding for adequate breastfeeding support at all WIC sites in NYC, and paid maternity leave.

For surveillance and evaluation purposes, DOHMH routinely analyzes city-level data from the CDC-funded Pregnancy Risk Assessment Monitoring System (PRAMS), a national survey of a randomly selected representative sample of NYC births that is conducted postpartum and includes breastfeeding questions. Other data collection tools include a new NYC electronic birth certificate and a 2005 survey of all 44 NYC hospitals with maternity units.

## LESSONS LEARNED

Local and state public health agencies are well positioned to lead concerted, coordinated multi-level actions to counter the formula industry's extensive financing and influence, and to convene key stakeholders to influence policies and practice on many levels. Efforts by DOHMH have demonstrated that it is difficult but possible to change both individual and institutional practices to support breastfeeding, and the DOHMH experience has provided several important lessons to inform continued and future breastfeeding promotion initiatives:

1. An investment of resources—money, staff, and technical assistance—is essential. System-wide changes require labor-intensive, sustained efforts by personnel who are paid and evaluated to promote and support breastfeeding. Hospitals and health providers are over-burdened with their existing responsibilities, and even committed breastfeeding advocates will not have the capacity to make changes without an infusion of new resources.
2. A partnership between a local public health agency and hospitals enables a systematic approach to establishing the rationale for institutional and individual change and to implementing and sustaining these changes. Clinical and public health approaches are complementary and reinforcing when both institutions find common ground for goals and implementation.
3. Champions are needed on all levels to mitigate institutional resistance to change. Agency leadership must prioritize the initiative and set high expectations for change. Passionate staff with credibility among their colleagues and subordinates are essential for obtaining buy-in among the nurses, physicians and administrators affected by changes.
4. Clear objectives and accountability mechanisms are critical to measuring success and overcoming barriers to change. Incorporating changes into existing systems, such as the electronic information system and performance evaluations, can facilitate tracking of progress and institutional cooperation throughout the change process.
5. Incentives for successes, including an emphasis on how the changes can benefit the staff and the institution, are key motivators in the change process.
6. An aggressive breastfeeding promotion campaign will elicit public and vocal resistance from formula companies, individuals and institutions that have a stake in the infant formula industry. A government-sponsored breastfeeding initiative must be prepared to respond to criticism with a clear rationale for breastfeeding promotion and ample success stories. Also critical are strong partnerships and a unified message among key public and private sector stakeholders.
7. Policies that support breastfeeding at the workplace, community, and city and state levels are essential to sustaining change. Initiation and continuation of breastfeeding depend on paid maternity leave and community and

workplace policies that recognize and make the role of breastfeeding in protecting mothers' and infants' health public health priorities.

## CONCLUSION

Breastfeeding promises significant cost savings compared to formula feeding: according to the US Department of Agriculture, the USA would save a minimum of $3.6 billion per year in health care and indirect costs if at least 75% of mothers initiated breastfeeding, and 50% breastfed until the infant is at least 6 months old.[19,24]

Efforts to make breastfeeding the norm can succeed, but they must become a public health priority. These efforts count on effective partnership among governmental and non-governmental agencies, hospitals and healthcare providers, health professional bodies, community-based organizations, employers and trade unions. The partnership must issue clear, consistent messages that not only promote the benefits of breastfeeding but illuminate the negative effects of formula feeding. In NYC, DOHMH and its partners must continue their coordinated efforts to eliminate formula marketing from hospitals, health care providers, and direct-to-consumer promotions. Through strategic collaboration we can increase rates of breastfeeding and make it the norm in NYC.

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