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Breastfeeding Rates in US Baby-Friendly Hospitals: Results of a National Survey

Anne Merewood, MA, IBCLC*‡; Supriya D. Mehta, PhD, MHS§; Laura Beth Chamberlain, BA, IBCLC‡; Barbara L. Philipp, MD*‡; and Howard Bauchner, MD, MPH*‖

ABSTRACT. *Objectives.* **The objectives of this study were to analyze all available breastfeeding data from US Baby-Friendly hospitals in 2001 to determine whether breastfeeding rates at Baby-Friendly designated hospitals differed from average US national, regional, and state rates in the same year and to determine prime barriers to implementation of the Baby-Friendly Hospital Initiative.**

Methods. **In 2001, 32 US hospitals had Baby-Friendly designation. Using a cross-sectional design with focused interviews, this study surveyed all 29 hospitals that retained that designation in 2003. Demographic data, breastfeeding rates, and information on barriers to becoming Baby-Friendly were also collected. Simple linear regression was used to assess factors associated with breastfeeding initiation.**

Results. **Twenty-eight of 29 hospitals provided breastfeeding initiation rates: 2 from birth certificate data and 26 from the medical record. Sixteen provided in-hospital, exclusive breastfeeding rates. The mean breastfeeding initiation rate for the 28 Baby-Friendly hospitals in 2001 was 83.8%, compared with a US breastfeeding initiation rate of 69.5% in 2001. The mean rate of exclusive breastfeeding during the hospital stay (16 of 29 hospitals) was 78.4%, compared with a national mean of 46.3%. In simple linear regression analysis, breastfeeding rates were not associated with number of births per institution or with the proportion of black or low-income patients. Of the Ten Steps to Successful Breastfeeding the 3 described as most difficult to meet were Steps 6, 2, and 7. The reason cited for the problem with meeting Step 6 was the requirement that the hospital pay for infant formula.**

Conclusion. **Baby-Friendly designated hospitals in the United States have elevated rates of breastfeeding initiation and exclusivity. Elevated rates persist regardless of demographic factors that are traditionally linked with low breastfeeding rates.** ***Pediatrics*** **2005;116:628–634;** ***breastfeeding, Baby-Friendly Hospital Initiative.***

ABBREVIATIONS. WHO, World Health Organization; UNICEF, United Nations Children's Fund; BFHI, Baby-Friendly Hospital Initiative; RMS, Ross Mothers' Survey.

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The World Health Organization (WHO) and United Nations Children's Fund (UNICEF) launched the Baby-Friendly Hospital Initiative (BFHI) in 1991 as an international program to increase breastfeeding rates worldwide. To receive Baby-Friendly designation, a hospital or birthing site must demonstrate that the Ten Steps to Successful Breastfeeding (Table 1) have been implemented. In 2004, of the ~18 000 Baby-Friendly hospitals worldwide, 42 were located in the United States. The BFHI has been associated with elevated breastfeeding rates in 1 US hospital,[1–3] in other nations,[4–6] and with increased breastfeeding duration and improved health outcomes, as demonstrated by a randomized controlled trial in Belarus.[6] Other studies have indicated a causal effect between Baby-Friendly status and elevated breastfeeding rates.[1,3,6] To date, no data have been published in the United States regarding breastfeeding rates in Baby-Friendly hospitals at the national level.

The objectives of this study were to analyze all available breastfeeding data from US Baby-Friendly hospitals in 2001, to describe the characteristics of Baby-Friendly hospitals in the United States, and to determine whether breastfeeding rates at US Baby-Friendly hospitals differed from average US national, regional, and state rates in the same year. Additional objectives were to assess the effect of race and demographics on breastfeeding rates at Baby-Friendly hospitals and to determine the most difficult of the Ten Steps with regard to implementation of the BFHI. We hypothesized that Baby-Friendly hospitals would have higher breastfeeding rates than non–Baby-Friendly hospitals at both the national and the regional levels and that these elevated rates would persist regardless of demographics.

METHODS

In 2003, when this project began, we selected 2001 as the year of study to enable us to gather complete demographic and breastfeeding data from our sources. Baby-Friendly USA, the nonprofit organization charged with implementation of the BFHI in the United States, provided a list of all 32 US birthing sites that were Baby-Friendly certified in 2001. By 2003, 2 of these hospitals had closed and 1 was no longer designated Baby-Friendly. Our data were obtained from the remaining 29 hospitals.

The Baby-Friendly coordinator at each site was interviewed by telephone regarding rates of breastfeeding initiation and exclusivity, breastfeeding rate data collection methods, hospital demographics, and barriers to gaining Baby-Friendly status. When information was not immediately available, the coordinator subsequently obtained this information and e-mailed or faxed

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TABLE 1. Ten Steps to Successful Breastfeeding

1. Have a written breastfeeding policy that is regularly communicated to all health care staff.
2. Train all staff in skills necessary to implement this policy.
3. Inform all pregnant women about the benefits and management of breastfeeding.
4. Help mothers initiate breastfeeding within an hour of birth.
5. Show mothers how to breastfeed and how to sustain lactation, even if they should be separated from their infants.
6. Feed newborn infants nothing but breast milk, unless medically indicated, and under no circumstances provide breast milk substitutes, feeding bottles, or pacifiers free of charge or at low cost.
7. Practice rooming-in, which allows mothers and infants to remain together 24 hours a day.
8. Encourage breastfeeding on demand.
9. Give no artificial pacifiers to breastfeeding infants.
10. Help start breastfeeding support groups and refer mothers to them.

outstanding answers to researchers. The study was approved by the Boston University Medical Center Institutional Review Board.

Data collection methods used at each hospital were scrutinized for accuracy. The definition of breastfeeding initiation, imposed by the research team, was whether the infant received "any breast milk during the hospital stay." This definition matches the definition of breastfeeding on the Ross Mothers' Survey (RMS), with which breastfeeding rates in this study were compared. The RMS asks what the infant was fed in the hospital, prompting women to check off all types of nutrition from a list that includes breast milk and various brands of infant formula. The RMS has long been considered the national source of breastfeeding rate data in the United States,[7] despite the potential for conflict of interest, as Ross Pediatrics manufactures infant formula. In 2004, the Centers for Disease Control and Prevention published comprehensive national and regional breastfeeding rates, based on questions added to the National Immunization Survey.[8] Although these data seem set to become the new national standard and are likely to be viewed as more credible than the RMS as a result of the lack of conflict of interest, they were published in 2003, with only limited data for 2001,[9] and thus were not used for data comparison in this study.

Hospitals that provided exclusive breastfeeding rates were asked how their institution defined exclusivity. Nine of the 16 stated that they defined exclusive breastfeeding as "infant receives only breast milk." Six stated that "exclusive breastfeeding" included breast milk and sugar water supplements received for "medical purposes." One defined its exclusivity data as "reflecting the mother's approach to supplementation," stating that exclusively breastfed infants who received formula or sugar water for medical purposes only were considered to be exclusively breastfed.

Methods of collecting breastfeeding initiation rates also varied between the hospitals. The following methods were cited: recording individual feeding data (each feed) in a unit log book or computerized charting system and entering individual feeding data and assessing breastfeeding initiation rates (and exclusivity, in institutions that recorded exclusivity) by monthly review, then averaging for the year (8 hospitals); charting feeding status at birth and on discharge and reviewing data at the end of the year (5 hospitals); entering individual feeding data and assessing breastfeeding initiation and exclusivity rates by monthly review, then averaging for the year (3 hospitals); reviewing state data on the basis of the birth certificate question (2 hospitals); entering individual feeding data and assessing breastfeeding rates each quarter as an ongoing quality improvement project (1 hospital); entering feeding data into a computer charting system, with "feeding method" as a mandatory field, and analyzing 5 months of data to approximate an annual rate (1 hospital); recording feeding method at the 3-day postpartum visit and analyzing these rates annually (1 hospital); randomly selecting and analyzing 200 charts annually (1 hospital); and recording breastfeeding rates on the postpartum unit from the birth certificate and analyzing 6 months of data to approximate an annual rate (1 hospital). Birthing centers generally had short postpartum stays, and rates at 5 birth centers were recorded in the center at 6 hours of life and then again at the first home visit, which took place within 48 hours. Three centers provided us with breastfeeding rate data that were already analyzed; 2 analyzed the data specifically for this study.

The 1 hospital that was unable to provide us with a rate stated that data were collected in a book on the postpartum unit, recording initial feeding method and any change in feeding status. The data, however, had not been analyzed for 2001 and were not available.

Regarding demographics, descriptive estimates of race/ethnicity or insurer status by the coordinator were not considered valid. Information that was judged to be acceptable was obtained, for example, from medical records, billing data, an annual report, or a similar administrative data collection system. Nineteen of 29 hospitals provided valid data on race/ethnicity. Twenty-two of 29 hospitals provided valid data on insurance status.

Simple linear regression was used to assess the association between hospital and patient characteristics and rates of newborn breastfeeding initiation and exclusivity. Proportions were entered into a simple linear regression model as whole numbers. For example, if a Baby-Friendly facility reported that 85% of newborns initiated breastfeeding, then the data were entered as "85.0," rather than "0.85." Therefore, the coefficients represent percentage point increases in newborn breastfeeding initiation associated with the variable of interest. Rate data from Baby-Friendly hospitals were compared with data collected by Ross Pediatrics for the same year, at the national, state, and regional levels.

In addition, we asked hospitals, "Which of the Ten Steps was most difficult to implement when attempting to become Baby-Friendly?" Responses were matched according to the Step with which they were considered most consistent. We sought assistance from Baby-Friendly USA when there was any ambiguity. Although it is beyond the scope of this article to discuss ways in which such barriers can be overcome, we have published accounts of overcoming barriers to becoming Baby-Friendly, including paying for the formula, in our own institution.[10,11]

RESULTS

The mean number of births at US Baby-Friendly hospitals in 2001 was 1227 (median: 668; range: 37–4082), for a total of 34 365 births. Of the 29 hospitals, 11 served predominantly urban populations, 9 rural, 8 suburban, and 1 military. Sixteen institutions self-identified as community hospitals, 5 as academic teaching centers, 5 as free-standing birth centers (not affiliated with a larger institution), 1 as a birth center (affiliated with a larger hospital), 1 as a district hospital, and 1 as a military hospital (Table 2).

Breastfeeding initiation rates were obtained from 28 of 29 hospitals. Two hospitals obtained these rates from the birth certificate, and 26 obtained rates from the medical record. One hospital was unable to provide breastfeeding data. Sixteen hospitals provided in-hospital exclusive breastfeeding rates.

The mean breastfeeding initiation rate in 2001 for the 28 Baby-Friendly hospitals was 83.8% (median: 85.3%; range: 58%–100%). By comparison, the US breastfeeding initiation rate in 2001 was 69.5%.[12] The mean rate of exclusive breastfeeding during the hospital stay for the 16 reporting Baby-Friendly hospitals was 78.4% (median: 86%; range: 25–100%). By comparison, the US in-hospital, exclusive rate in 2001 was 46.3%.[12] By Shapiro-Francia test for normality, the distribution of newborn breastfeeding initiation and exclusivity rates did not differ significantly from normal.

Location was considered as a possible confounder for elevated breastfeeding rates. Typically, western

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TABLE 2. Demographics and Breastfeeding Rates

Hospital	Location	No. of Births	Type of Institution	Breastfeeding Initiation Rate	State Breastfeeding Rate	Regional Breastfeeding Rate	Exclusive In-Hospital Rate	Prime Population Served
1	Pacific	150	Free-standing birthing center	100%	81.7%	82.9%	100%	Suburban
2	Pacific	37	Free-standing birthing center	100%	88.1%	82.9%	100%	Urban
3	Pacific	48	Free-standing birth center	100%	81.7%	82.9%	100%	Suburban
4	Pacific	457	Community hospital	99%	88.1%	82.9%	N/A	Urban
5	Pacific	3100	Community hospital	98%	81.7%	82.9%	93%	Urban
6	Pacific	591	Community hospital	98%	87.2%	82.9%	N/A	Rural
7	Pacific	317	Community hospital	97%	81.7%	82.9%	87%	Suburban
8	Pacific	3700	District hospital	92%	87.2%	82.9%	N/A	Suburban
9	Pacific	1982	Community hospital	91%	88.5%	82.9%	86%	Urban
10	Pacific	1450	Community hospital	89%	88.1%	82.9%	N/A	Suburban
11	Pacific	621	Community hospital	88%	88.1%	82.9%	86%	Rural
12	Pacific	N/A	Military hospital	N/A	–	82.9%	N/A	Military
13	New England	2056	Academic teaching center	87%	70.9%	70.8%	25%	Urban
14	New England	207	Community hospital	83%	74.7%	70.8%	82%	Rural
15	New England	202	Community hospital	82%	73.5%	70.8%	79%	Rural
16	New England	572	Community hospital	73%	63.2%	70.8%	58%	Rural
17	New England	254	Community hospital	70%	79.1%	70.8%	65%	Rural
18	New England	4082	Academic teaching center	69%	69.4%	70.8%	N/A	Urban
19	East South Central	81	Free-standing birth center	96%	59.2%	54.4%	96%	Urban
20	East South Central	81	Free-standing birth center	83.5%	59.2%	54.4%	N/A	Rural
21	East South Central	2974	Academic teaching center	69%	54%	54.4%	52%	Suburban
22	East South Central	768	Community hospital	65%	59.2%	54.4%	N/A	Rural
23	South Atlantic	863	Community hospital	77%	69.6%	65.7%	N/A	Suburban
24	East North Central	714	Community hospital	74%	70.1%	64.6%	N/A	Rural
25	East North Central	1779	Academic teaching center	68%	65.2%	64.6%	N/A	Urban
26	East North Central	1055	Community hospital	58%	62.4%	66.6%	48%	Urban
27	Mountain	3552	Community hospital	75%	71.6%	82.8%	N/A	Suburban
28	Mid-Atlantic	90	Birthing center	98%	61.7%	64.6%	97%	Urban
29	Mid-Atlantic	2582	Academic teaching center	67%	64.8%	64.6%	N/A	Urban

and mountain states have the highest breastfeeding rates and southern states have the lowest,[12,13] and a high concentration of Baby-Friendly hospitals in high-initiating regions could have skewed the data. However, only 17 of the 28 hospitals were located in states with breastfeeding initiation rates above the national average. Initiation rates at Baby-Friendly hospitals were positively associated with state ($P < .001$; Table 2) and region ($P = .001$; Table 3).

In simple linear regression analysis (Table 4), breastfeeding initiation rates were not associated with number of births per institution. We also examined the association between type of facility as a single categorical variable and breastfeeding rates. Academic and community hospital status were not associated with newborn breastfeeding initiation rate. Birthing center status (6 of 28) was associated with an increase of almost 14 percentage points in newborn breastfeeding initiation rate (Table 4). None of the birthing centers had pediatricians or obstetricians on staff, whereas all of the other facilities did.

Analysis of breastfeeding rates by race were based on the percentage of births to African American/black women. In 2001, there were 4 025 933 live births in the United States, 606 156 (15.1%) of which were African American/black.[14] Therefore, we dichotomized the proportion of patients who were African American/black at each Baby-Friendly hospital as above the national mean (≥15.1%) or below the mean (<15.1%). Only 3 (14%) of the Baby-Friendly hospitals had a proportion of African American/black patients above the national proportion. The mean initiation rate at those hospitals with a higher proportion of African American/black patients was 70.7% compared with 84.3% for hospitals with a proportion of African American/black patients <15.1% ($P = .10$). The proportion of African American/black patients at Baby-Friendly hospitals was also not associated with breastfeeding initiation when examined as a continuous variable.

An increasing percentage of patients who were Hispanic at an institution was associated with a slightly increasing breastfeeding initiation rate ($P = .025$). Statistically significant associations were observed between lower breastfeeding initiation rates in Baby-Friendly hospitals with increasing proportion of births by cesarean section ($P = .007$) and with having pediatricians or obstetricians on staff ($P = .006$) or family practitioners on staff ($P = .043$). With regard to exclusive breastfeeding as a second outcome, increasing proportion of African American/black patients was associated with a slight decrease in exclusive breastfeeding rates (coefficient = −0.83, $P = .063$), but the proportion of low-income patients (judged by insurance status) was not associated with a decrease in exclusive breastfeeding rate (coefficient = 0.08, $P = .817$).

The 3 Steps described as the most difficult to meet when becoming Baby-Friendly compliant were Step 6 (9 of 29), Step 2 (8 of 29), and Step 7 (5 of 29). The reason cited for the problem with meeting Step 6 was the requirement that the hospital pay for infant formula. Other Steps cited as the most difficult to implement were Steps 4 and 9. Four institutions (all free-standing birth centers and all with <400 births

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TABLE 2. Continued

% Native American/ Pacific Islander	% Asian	% Black	% Hispanic	% White	% Other Race	% Private Insurance	% Medicaid	% No Insurance/ Self-Pay/ Other	Hospital Has NICU	Cesarean Birth Rate	Epidural Rate
–	–	–	20%	70%	10%	20%	70%	10%	No	No cesareans*	0
–	–	–	–	96%	4%	56%	42%	2%	No	No cesareans*	0
N/A	N/A	N/A	N/A	N/A	N/A	27%	69%	4%	No	No cesareans*	0
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No	23%	33%
0.2%	21%	2%	26%	50%	–	100%	–	–	Yes	15%	76%
–	–	1%	35%	64%	–	N/A	N/A	N/A	Yes	21%	40%
N/A	N/A	N/A	N/A	N/A	N/A	69%	27%	4%	No	21%	42%
1%	9%	2%	5%	83%	–	N/A	N/A	N/A	Yes	31%	74%
N/A	N/A	N/A	N/A	N/A	N/A	100%	–	–	Yes	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	74%	25%	10%	Yes	18%	50%
–	–	1%	4%	95%	–	38%	61%	1%	No	21%	N/A
N/A	N/A	N/A	N/A	N/A	N/A	100%	–	–	No	N/A	N/A
–	–	54%	23%	9%	14%	13%	48%	40%	Yes	26%	40%
–	–	–	–	85%	15%	N/A	N/A	N/A	No	24%	N/A
–	–	–	–	99%	1%	33%	65%	2%	No	16%	0
N/A	N/A	N/A	N/A	N/A	N/A	85%	15%	–	No	25%	N/A
–	–	–	–	99%	1%	40%	60%	–	No	22%	0
0.4%	0.6%	10%	23%	62%	4%	N/A	N/A	N/A	No	23%	N/A
–	2%	6%	2%	90%	–	30%	65%	5%	No	No cesareans*	0
–	–	–	20%	80%	–	24%	76%	–	No	No cesareans	0
0.002%	2%	4%	0.05%	94%	–	54%	36%	11%	Yes	25%	N/A
1%	1%	2%	1%	95%	–	70.5%	28.5%	0.08%	Yes	25%	61%
0.1%	0.5%	5.3%	3%	91%	–	N/A	N/A	N/A	No	31%	N/A
–	1%	1%	17%	82%	–	73%	25%	2%	No	21%	31%
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Yes	19%	75%
0.1%	0.1%	59.4%	0.3%	40.1%	–	45%	55%	–	Yes	16%	73%
–	–	10%	5%	85%	–	95%	5%	–	No	30%	80%
–	–	–	42%	57%	1%	30%	45%	25%	No	No cesareans*	0
0.3%	1.2%	17.2%	–	79%	2.3%	71%	28.5%	0.05%	Yes	24%	37%

N/A indicates data not available from this institution.
* Low risk births only; cesarean births not offered in this institution.

per year) reported no problem with implementing any Step.

DISCUSSION

We found that, overall, in 2001, US Baby-Friendly hospitals had breastfeeding rates above state, regional, and national rates, and these rates were consistently elevated in a variety of settings. Breastfeeding initiation rates were not associated with the size of the institution, were above average in regions with low breastfeeding rates, and remained high among populations who do not traditionally breastfeed. Low-income women traditionally have low breastfeeding rates,[13] but, judged by insurer status, high proportions of low-income patients were not associated with decreased breastfeeding rates at Baby-Friendly hospitals.

Our findings regarding race and breastfeeding rates demand closer inspection. Nationally, black mothers have the lowest breastfeeding rates in the United States,[13,15] but rates of breastfeeding in the 3 Baby-Friendly hospitals with percentages of black patients above the national norm did not differ significantly from rates in hospitals with percentages of black patients below the national average. We acknowledge that the difference approached statistical significance. By contrast, the percentage of Hispanic women who gave birth at a Baby-Friendly hospital was associated with an elevated breastfeeding rate. These outcomes are to be expected. If Baby-Friendly hospitals improve breastfeeding conditions for all women, then those with traditionally lower breastfeeding rates would be expected to have above-average breastfeeding rates in the Baby-Friendly setting. In 2001, however, Hispanic women had the highest breastfeeding initiation rates in the United States.[13] The Baby-Friendly hospital, although leveling the playing field for disadvantaged women, would not be expected to cause rates to drop in groups with the highest rates. These findings must be interpreted with caution, as a result of small number of institutions evaluated in this study. Only 3 hospitals had percentages of black patients above the national mean. In addition, because of a lack of detailed data, we were unable to assess race/ethnicity beyond the common designations of African American/black, white, and Hispanic. It is known that within those groups, differences exist with regard to breastfeeding, depending on maternal birth place. For example, US-born black individuals have lower breastfeeding rates than black individuals who are born outside the United States,[16] and women of Mexican origin have higher breastfeeding initiation rates than Puerto Ricans.[17] It is possible that large numbers of non–US-born black women or a higher proportion of Hispanic women from nations with high breastfeeding rates at the institutions involved were responsible for the race-related associations that were observed.

In terms of regional and state rates, 4 Baby-Friendly hospitals had breastfeeding rates lower than the rate for their state, and 4 had rates lower

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TABLE 3. Baby-Friendly Newborn Breastfeeding Initiation Rates Compared to US National and Regional Breastfeeding Initiation Rates

Breastfeeding Rates	US National	New England	Mid-Atlantic	East North Central	West North Central	South Atlantic	East South Central	West South Central	Mountain	Pacific
Mean: Ross data 2001	69.5%	70.8%	64%	64.6%	72%	65.7%	54.4%	65.9%	82.8%	82.9%
Mean: Baby-Friendly hospitals 2001	83.8% (N = 28)	77.3% (N = 6)	82.5% (N = 2)	66.6% (N = 3)	No breastfeeding hospital	77% (N = 1)	78.3% (N = 3)	No breastfeeding hospital	75% (N = 1)	95.63% (N = 12)

than the rate for their region (Table 2). Most of these differences were minimal.

We noted that breastfeeding data collection methods varied by hospital. The process of renewal of Baby-Friendly status is still under review but includes the expectation that breastfeeding initiation and exclusivity rates be collected on an ongoing basis in the years after designation. Thus, these hospitals might be more likely than non–Baby-Friendly hospitals to record breastfeeding rates. Despite this, although all hospitals but 1 were able to provide breastfeeding initiation rates, barely half of the institutions had data on exclusive breastfeeding, the "gold standard" of infant feeding.[17]

The definition of "exclusive breastfeeding" also differed between hospitals. However, we doubt that a true distinction can be made between the definitions offered, as several respondents stated that sugar water feeds were not recorded in the medical record. In hospitals where this happened and the medical record was the prime data source, "exclusively breastfed" infants may have received sugar water feeds. Similarly, birth certificate data are gained from maternal report and would be unlikely to reflect sugar water feeds. Thus, the difference between these 2 definitions is unlikely to be reliable. This is also the case with national data collection. The RMS is probably a reliable source of exclusivity data in terms of breast milk versus formula, because it prompts women to check off all types of feeds given, but sugar water is not listed as an option. In addition, infants may be given sugar water in a hospital without the parent's knowledge. Issues around the definition of exclusive breastfeeding are ongoing and national in scope, and there is no evidence to suggest that such data are any more or less reliably recorded in Baby-Friendly hospitals than elsewhere.

Although 10 of the 29 hospitals collected duration rates, the points of data collection varied from 2 weeks to 1 year, making it impossible to extract meaningful overall data on duration rates or to compare duration rates between institutions. As the number of Baby-Friendly hospitals grows, a universal rate-tracking system is urgently needed, not only in the United States but also worldwide. Without such data, monitoring the effectiveness of the initiative over time is almost impossible.

A limitation of this study is that breastfeeding rates from Baby-Friendly institutions are based on hospital records, whereas the national data used for comparison are obtained from mothers' answers to a mail-in survey during the first year of life. Although this difference in data sources might be expected to lead to inconsistencies, research indicates that maternal recall is a reliable method by which to measure infant feeding method if gained in the first 3 years after birth.[18] We have no reason to believe that data collection methods at Baby-Friendly hospitals inflate the breastfeeding rate or contribute to our findings that Baby-Friendly breastfeeding rates are above the regional and national averages.

Another limitation of this study is the small number of Baby-Friendly hospitals involved, although we surveyed all hospitals from 2001 that retained that

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TABLE 4. Results of Simple Linear Regression Analyses

Variable, *N**	Intercept	Coefficient	95% CI	*P* Value	Adjusted R^2
Continuous variables					
Proportion of patients Hispanic (21)	77.2	0.48	0.06 to 0.90	.028	0.189
Proportion of patients black (21)*	84.8	−0.29	−0.65 to 0.06	.098	0.092
Proportion of Patients Medicaid (21)*	80.8	0.07	−0.19 to 0.34	.569	−0.034
Proportion of patients undergoing cesarean section (27)	94.9	−0.64	−1.09 to 0.18	.007	0.224
No. of births annually	87.8	−0.00	−0.01 to 0.00	.105	0.063
Categorical variables					
Have family practice (28)	90.5	−10.3	−20.3 to 0.34	.043	0.115
Type of facility (28)	82.3				0.294
Community hospital		–	–	–	
Birthing center		13.9	3.06 to 24.8	.014	
Academic		−10.3	−22.0 to 1.33	.080	
Other†		9.69	−13.7 to 33.1	.402	

CI indicates confidence interval.
* *N* represents the number of hospitals that reported results for the individual question. Multivariate analysis was not conducted because of small sample size and unavailable data.
† Includes the 1 district hospital and the 1 military hospital.

designation in 2003. As a result of the small sample size, we did not use logistic regression to examine the magnitude of various associations on breastfeeding rates, and we were unable to adjust for multiple variables. The small sample size and missing data limit our ability to interpret and draw conclusions from the data.

Clearly, a survey such as this cannot produce evidence for specific reasons that may be responsible for increased breastfeeding rates in Baby-Friendly institutions, although these have been stated elsewhere.[1–6,16,19,20] Baby-Friendly policies, self-selection of hospitals with high breastfeeding rates, and some other confounding effect of these hospitals all could contribute to elevated breastfeeding rates. Our results suggest a need for prospective study into the effect of individual and collective steps and process of becoming Baby-Friendly.

CONCLUSION

The evidence-based Ten Steps to Successful Breastfeeding operate as a model for breastfeeding promotion and support, creating breastfeeding-friendly hospital systems that have consistently been linked with increased breastfeeding success.[1–6,20–23] Breastfeeding rates above regional and national rates are present in most Baby-Friendly hospitals. Prospective studies are needed to examine causal factors associated with increased or decreased breastfeeding rates within Baby-Friendly hospitals. In addition, standardized and expanded data collection methods of breastfeeding rates, hospital and patient factors, and implementation and ongoing barriers will enhance evaluation of Baby-Friendly hospitals. We suggest that by creating a system that supports breastfeeding, the BFHI enables women to breastfeed at rates above regional and national levels. Our findings of consistently elevated rates of breastfeeding initiation at Baby-Friendly hospitals are relevant to clinicians, hospital administrators, and policy makers.

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THE FUTURE OF THE BRAIN: THE PROMISE AND PERILS OF TOMORROW'S NEUROSCIENCE

"In contrast to many books that 'dumb down' science for the lay public, Steven Rose [author of: *The Future of the Brain: The Promise and Perils of Tomorrow's Neuroscience*] displays respect for the intelligence of his audience. Although the book is accessible to the educated nonscientist reader, Rose's discussions of science with regard to the brain are sufficiently sophisticated that the professional researcher has much to learn. A unique strength of Rose's presentation is his emphasis on historical background of present-day knowledge. Of equal importance is his critical analysis of the epistemological aspects of neuroscience. For instance, in the chapter dealing with mental illness, he relates the classic study of David Rosenhan, 'On Being Sane in Insane Places' (published in *Science* in 1973), in which Rosenhan and a team of volunteers sought admission to psychiatric hospitals by claiming that they heard voices. Once inside the hospital, they behaved normally and maintained that the voices had ceased. The physicians caring for them regarded their protestations of normality as evidence of abnormality and were reluctant to release them. To add insult to injury, Rosenhan subsequently announced that another group of 'pseudo-patients' would be presented to psychiatric hospitals in the vicinity, whereupon there was an epidemic of diagnoses of pseudo-patients—who never existed.

Rose is highly critical of the excesses of psychopharmacology, perhaps too much so. He devotes substantial space to the use of stimulant drugs such as Ritalin (methylphenidate) to treat attention deficit–hyperactivity disorder. He properly questions how one can diagnose as a 'disease' a condition characterized by a child's being more active or paying less attention than 'the majority' of children in the classroom. He is dubious about the reality of a disorder that is diagnosed in England at 1/10 the rate in the United States."

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