

Nativity/Immigrant Status, Race/Ethnicity, and Socioeconomic Determinants of Breastfeeding Initiation and Duration in the United States, 2003

Gopal K. Singh, PhD^a, Michael D. Kogan, PhD^a, Deborah L. Dee, MPH^b

^aMaternal and Child Health Bureau, Health Resources and Services Administration, Rockville, Maryland; ^bDepartment of Maternal and Child Health, School of Public Health, University of North Carolina, Chapel Hill, North Carolina

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ABSTRACT

OBJECTIVES. Previous research has shown substantial racial/ethnic and socioeconomic disparities in US breastfeeding initiation and duration rates. However, the role of immigrant status in understanding such disparities has not been well studied. In this study we examined the extent to which breastfeeding initiation and duration varied by immigrant status overall and in conjunction with race/ethnicity and socioeconomic status after controlling for other relevant social and behavioral covariates.

METHODS. The cross-sectional data for 33 121 children aged 0 to 5 years from the 2003 National Survey of Children's Health were used to calculate ever-breastfeeding rates and duration rates at 3, 6, and 12 months by social factors. Multivariate logistic regression was used to estimate relative odds of never breastfeeding and not breastfeeding at 6 and 12 months.

RESULTS. More than 72% of mothers reported ever breastfeeding their infants, with the duration rate declining to 52%, 38%, and 16% at 3, 6, and 12 months, respectively. Ever-breastfeeding rates varied greatly among the 12 ethnic-immigrant groups included in this analysis, from a low of 48% for native black children with native parents to a high of 88% among immigrant black and white children. Compared with immigrant Hispanic children with foreign-born parents (the least acculturated group), the odds of never breastfeeding were respectively 2.4, 2.9, 6.5, and 2.4 times higher for native children with native parents (the most acculturated group) of Hispanic, white, black, and other ethnicities. Socioeconomic patterns also varied by immigrant status, and differentials were greater in breastfeeding at 6 months.

CONCLUSIONS. Immigrant women in each racial/ethnic group had higher breastfeeding initiation and longer duration rates than native women. Acculturation was associated with lower breastfeeding rates among both Hispanic and non-Hispanic women. Ethnic-immigrant and social groups with lower breastfeeding rates identified herein could be targeted for breastfeeding promotion programs.

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Key Words

breastfeeding initiation and duration, immigrant status, acculturation, race/ethnicity, Hispanics, Asians, socioeconomic status, social support, disparities, United States

Abbreviations

SIDS—sudden infant death syndrome
SES—socioeconomic status
NSCH—National Survey of Children's Health

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Address correspondence to Gopal K. Singh, PhD, Maternal and Child Health Bureau, Health Resources and Services Administration, 5600 Fishers Lane, Room 18-41, Rockville, MD 20857. E-mail address: gsingh@hrsa.gov

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PREVIOUS RESEARCH HAS identified substantial health benefits of breastfeeding for both children and their mothers.¹ These benefits include decreased incidence of childhood infections; lower sudden infant death syndrome and postneonatal mortality rates; reduced incidence of childhood obesity, diabetes, and certain childhood cancers; and enhanced cognitive development, among others.¹ The maternal health benefits include decreased postpartum bleeding and lower risks of breast and ovarian cancers.¹ Other important benefits include an increased physical and psychological bond between mother and child and potential annual savings of \$3.6 billion in US health care costs.¹ Given these benefits, the American Academy of Pediatrics recommends exclusive breastfeeding of infants for at least the first 6 months of their lives and continued breastfeeding until 12 months old, and as long thereafter as mutually desired.¹

Previous studies have shown substantial disparities in both breastfeeding initiation and duration rates in the United States by a number of sociodemographic factors, including race/ethnicity and socioeconomic status.²⁻⁶ Although higher maternal or parental education and household income levels have been strongly linked to higher breastfeeding initiation and duration rates, they do not fully account for the observed racial/ethnic differences in breastfeeding.³⁻⁵ Black women are consistently shown to have lower and Hispanic women higher breastfeeding rates than their non-Hispanic white counterparts of comparable socioeconomic background.³⁻⁵ The continued racial/ethnic disparities in breastfeeding, after adjustment for the known socioeconomic and behavioral risk factors, may reflect important cultural and normative influences, which can be better understood if race/ethnicity is stratified by immigrant/nativity status. However, the role of immigrant status in understanding ethnic and social disparities in breastfeeding has not been well studied.^{7,8}

The immigrant population in the United States has grown considerably in the last 3 decades. In 2003, there were 33.5 million immigrants, an increase of 23.9 million since 1970. Immigrants now account for 12% of the total US population.^{9,10} The increase in the immigrant child population has also been substantial. The proportion of children living with at least 1 foreign-born parent in the United States rose from 12.1% in 1990 to 18.1% in 2000. Of these children, 4.4% were foreign born in 2000.¹¹ Given such a rapid increase in the immigrant population, it is important to know how breastfeeding patterns for this growing segment of the population differ from those of the majority native population. The purpose of this study was, therefore, (a) to estimate breastfeeding initiation and duration rates for various ethnic-immigrant groups by using a large, nationally representative sample of US children, and (b) to examine the extent to which breastfeeding initiation and duration patterns vary by immigrant status overall and in con-

junction with race/ethnicity and SES after controlling for a variety of sociodemographic, social support, maternal health status, and behavioral characteristics.

METHODS

The data came from the National Survey of Children's Health (NSCH).^{12,13} The survey design is described briefly in the article by Kogan and Newacheck¹⁴ in this issue; more in-depth information can be found elsewhere.¹⁵

Analyses of disparities in breastfeeding initiation were conducted for 33 121 children from the NSCH who were <6 years of age at the time of the interview and for whom complete information on ever breastfeeding was available. The analysis of breastfeeding duration was conducted for 30 586 children aged <6 years because children still being breastfed and those with missing duration data were excluded. Information on breastfeeding initiation was derived from the question, "Was the child ever breastfed or fed breast milk?" Those answering yes to this question were further asked about how old (in days) the child was before he (she) stopped breastfeeding or being fed breast milk, which yielded information on breastfeeding duration. The dependent variable, breastfeeding initiation, was measured by the percentage of children ever breastfed, whereas breastfeeding duration was measured as the percentage of children who were breastfed for various times, such as 1 week and 3, 6, and 12 months.

Nativity/immigrant status, the main covariate of interest, was defined on the basis of children's own nativity and that of their parents. It consisted of 4 categories: foreign-born children with immigrant parents, US-born children with both immigrant parents, US-born children with 1 immigrant parent, and US-born children with both native-born parents.

Race/ethnicity was classified into 5 categories: non-Hispanic white, non-Hispanic black, Hispanic, Non-Hispanic mixed race, and other. The "other" category includes American Indians, Asians, and Hawaiians, who were individually delineated only for a few states as noted in Table 1. Besides immigrant status and race/ethnicity, we considered a variety of sociodemographic and behavioral factors that are known to influence the likelihood of breastfeeding initiation and duration. These included gender, parity, household composition, metropolitan/nonmetropolitan residence, parental education, household income or poverty status, neighborhood safety, familial support, maternal physical and emotional health status, maternal physical activity, and household smoking status.^{2-5,7,8,16-19} For each relevant covariate, the missing or unknown responses were used as a separate category in regression models instead of excluding them from the multivariate analyses, which would have resulted in a significant decrease in the effective sample size available for analysis.

Breastfeeding initiation and duration rates at 3, 6, and

TABLE 1 US Breastfeeding Initiation (Ever) and Duration Rates According to Selected Demographic, Socioeconomic, and Behavioral Characteristics: The 2003 NSCH

Characteristic	Ever-Breastfeeding Rate			Rate at 3 mo		Rate at 6 mo		Rate at 12 mo	
	Sample Size (Unweighted)	%	SE	%	SE	%	SE	%	SE
Total population	33 121	72.3	0.4	52.0	0.5	37.6	0.5	16.1	0.4
Gender									
Male	16 970	72.6	0.6	51.1	0.7	37.0	0.7	15.0	0.5
Female	16 137	72.1	0.6	52.9	0.7	38.2	0.7	17.2	0.6
Unknown	14	75.9	13.9	69.7	16.0	41.8	16.6	17.2	13.4
Birth order									
1	18 665	73.7	0.5	51.4	0.6	36.5	0.6	15.5	0.5
≥2	14 456	71.5	0.6	52.4	0.7	38.2	0.7	16.4	0.5
Race/ethnicity									
Non-Hispanic white	21 587	74.9	0.5	53.7	0.6	40.2	0.6	17.4	0.5
Non-Hispanic black	2821	51.4	1.5	34.5	1.5	23.4	1.4	7.1	0.8
Hispanic	5418	77.3	1.0	57.0	1.3	38.8	1.3	17.9	1.0
Non-Hispanic mixed race	1515	72.6	2.1	53.1	2.5	38.2	2.4	17.6	1.8
Other	1780	76.8	1.9	58.4	2.7	39.8	2.8	16.5	2.1
American Indian ^a	342	60.6	4.5	40.7	4.4	31.6	4.2	16.1	3.4
Asian ^a	243	88.8	3.3	71.4	5.9	39.2	7.0	13.4	4.4
Hawaiian/Pacific Islander ^a	127	73.1	5.6	47.1	5.8	37.7	5.4	23.6	4.6
Nativity/immigrant status									
Immigrant parents, foreign-born child	642	76.0	2.9	63.1	3.8	52.8	4.2	27.5	3.7
Both immigrant parents, US-born child	2350	85.5	1.2	66.5	1.8	46.2	1.9	20.7	1.5
1 immigrant parent, US-born child	2064	84.2	1.4	62.5	2.0	46.7	2.1	22.4	1.7
US-born parents, US-born child	28 065	69.6	0.5	49.1	0.5	35.4	0.5	14.7	0.4
Household composition									
2 parents, biological	24 926	77.5	0.4	57.0	0.6	42.2	0.6	18.4	0.5
2 parents, stepfamily	760	57.0	3.0	32.9	2.7	23.4	2.3	9.2	1.6
Single mother	5879	60.6	1.1	41.0	1.2	26.3	1.1	10.2	0.8
Other family type	1000	55.4	2.7	40.8	2.9	30.8	2.8	14.4	2.2
Unknown	556	43.2	3.6	25.7	3.2	15.7	2.8	4.4	1.3
Place of residence									
Metropolitan	17 186	74.0	0.5	54.0	0.6	39.2	0.6	16.8	0.5
Nonmetropolitan	5888	63.5	0.9	41.3	1.0	28.8	0.9	12.2	0.7
Unknown	10 047	74.8	0.7	55.3	0.8	40.6	0.8	17.2	0.6
Highest parental education level, y									
<12	1756	68.9	1.8	49.9	2.1	35.0	2.1	17.8	1.7
12	6685	57.9	1.0	37.2	1.1	23.8	0.9	9.9	0.7
≥13	24 488	78.5	0.4	58.3	0.6	43.5	0.6	18.4	0.5
Unknown	192	72.7	5.8	57.3	6.3	43.4	6.4	16.0	4.6
Household poverty status (ratio of family income to poverty threshold)									
<100%	4402	62.1	1.2	43.6	1.4	28.9	1.3	12.9	1.0
100%–200%	6535	67.4	1.0	45.9	1.2	32.9	1.1	15.6	0.8
200%–400%	10 290	74.7	0.7	53.5	0.9	39.5	0.9	16.9	0.7
≥400%	8757	82.1	0.6	62.6	0.9	46.5	0.9	18.0	0.7
Unknown	3137	72.5	1.3	52.8	1.7	38.1	1.6	16.4	1.3
Neighborhood safety									
Safe	28 055	73.4	0.4	52.8	0.5	38.1	0.5	16.4	0.4
Unsafe	4575	68.0	1.2	49.1	1.4	35.3	1.3	14.9	1.0
Unknown	491	66.1	4.0	45.9	4.4	34.8	4.3	13.9	3.4
Familial or social support ^b									
0 (low)	815	61.4	2.9	33.4	3.1	21.4	2.8	10.2	2.2
1	1805	67.2	1.9	45.7	2.2	31.9	2.1	13.5	1.7
2	4009	69.2	1.2	48.0	1.5	32.8	1.4	12.6	1.0
3	5967	70.5	1.0	49.0	1.2	33.8	1.2	15.1	0.9
4–6	12 203	73.0	0.7	53.6	0.8	39.3	0.8	17.0	0.6
≥7 (high)	8227	77.2	0.8	58.2	1.0	44.0	1.0	18.9	0.8
Unknown	95	73.6	6.5	56.2	8.5	40.4	9.1	15.5	6.0
Maternal physical health status									
Excellent/very good/good	29 857	73.7	0.4	53.2	0.5	38.6	0.5	16.4	0.4
Fair/poor	1831	66.9	1.8	47.7	2.1	32.6	2.1	15.9	1.8
Unknown	1433	52.4	2.3	35.0	2.3	24.7	2.1	10.3	1.4

TABLE 1 Continued

Characteristic	Ever-Breastfeeding Rate			Rate at 3 mo		Rate at 6 mo		Rate at 12 mo	
	Sample Size (Unweighted)	%	SE	%	SE	%	SE	%	SE
Maternal emotional health status									
Excellent/very good/good	30 349	73.7	0.4	53.3	0.5	38.5	0.5	16.4	0.4
Fair/poor	1319	65.9	2.2	45.8	2.4	33.0	2.4	16.4	2.0
Unknown	1453	50.6	2.4	34.1	2.3	24.6	2.1	9.7	1.4
Maternal exercise									
Physically active	17 906	74.7	0.6	55.0	0.7	40.6	0.7	17.2	0.5
Physically inactive	13 632	71.8	0.7	50.4	0.8	35.4	0.8	15.5	0.6
Unknown	1583	51.9	2.2	34.5	2.2	24.4	2.0	9.5	1.3
Household smoking status									
Smoker	5505	60.6	1.1	38.0	1.1	23.9	1.0	9.8	0.8
Nonsmoker	14 897	76.6	0.6	57.4	0.7	42.9	0.8	18.2	0.6
Unknown	12 719	72.3	0.7	51.7	0.8	37.2	0.8	16.4	0.6

^a American Indian/Alaska Native ethnicity was available for children in Alaska, New Mexico, North Dakota, Oklahoma, and South Dakota only. Asian ethnicity was available for children in California, New Jersey, New York, and Washington; Hawaiian/Pacific Islander ethnicity was available for children in Hawaii only.

^b This is based on the question, "During the past week, how many times did you or any family member take the child on any kind of outing, such as to the park, library, zoo, shopping, church, restaurants, or family gatherings?"

12 months were computed by all the demographic, socioeconomic, and behavioral factors considered, and the χ^2 statistic was used to test the overall association between each covariate and breastfeeding prevalence. Multivariate logistic regression models were used to examine the independent association between the likelihood of never breastfeeding and not breastfeeding for at least 6 or 12 months, and each of the covariates was considered. Joint effects of immigrant status with race/ethnicity and socioeconomic status were also examined by estimating multivariate models that controlled for the other covariates. To account for the complex sample design of the NSCH, SUDAAN software was used to conduct all statistical analyses.²⁰ Human subjects review was not required for this study.

RESULTS

Table 1 shows breastfeeding initiation (ever) and duration rates by race/ethnicity, immigrant status, and the other sociodemographic characteristics. Overall, 72% of US mothers reported ever breastfeeding their children, with duration rates declining to 69% at 1 week and to 52%, 38%, and 16% at 3, 6, and 12 months, respectively.

Significant differences in breastfeeding prevalence were observed by almost all the covariates (Table 1). Asian and Hispanic women had the highest breastfeeding initiation rates (89% and 77%, respectively), whereas black and American Indian women had the lowest rates (51% and 60%, respectively). Black women also had the lowest percentage of breastfeeding at 6 and 12 months. Differentials by immigrant status were substantial. More than 84% of the US-born children with at least 1 foreign-born parent had ever been breastfed, compared with only 70% of native children with native parents and 76% of immigrant children with foreign-

born parents. Children born to immigrant parents also experienced longer durations of breastfeeding.

Breastfeeding initiation and duration rates were significantly lower among children from single-parent households, nonmetropolitan residents, and children from socioeconomically disadvantaged households. Observed breastfeeding prevalence also increased significantly in relation to increasing levels of familial support.

Table 2 shows the adjusted odds of never breastfeeding and not breastfeeding for at least 6 or 12 months associated with immigrant status, race/ethnicity, and socioeconomic variables. Compared with non-Hispanic white women, non-Hispanic black women had 119% higher odds of never breastfeeding and 74% and 133% higher odds of not breastfeeding for at least 6 and 12 months, respectively. Compared with US-born children with both immigrant parents, the relative odds of never breastfeeding were 72% higher among immigrant children with foreign-born parents and 103% higher among native children with native parents. However, immigrant children with foreign-born parents had the highest likelihood of being breastfed at 6 and 12 months. Relative to this group, the odds of not breastfeeding at 6 or at 12 months were 2 times higher among native children with native parents.

The odds of never breastfeeding and not breastfeeding at 6 and 12 months were significantly higher for nonmetropolitan residents, for women in single-parent and 2-parent stepfamily households, for those with low familial support, and for those in smoking households. The odds of never breastfeeding and not breastfeeding at 6 months were at least 2 times higher for women with 12 years of education than those with college education. There was a consistent income gradient in the likelihood of not breastfeeding. Compared with women with family incomes exceeding 400% of the poverty threshold, those

TABLE 2 Duration-Specific Adjusted Odds of Not Breastfeeding According to Selected Demographic, Socioeconomic, and Behavioral Characteristics: The 2003 NSCH

Characteristic	Not Ever Breastfeeding		Not for At Least 6 mo		Not for At Least 12 mo	
	Odds Ratio ^{a,b}	95% Confidence Interval	Odds Ratio ^{a,b}	95% Confidence Interval	Odds Ratio ^{a,b}	95% Confidence Interval
Gender						
Male	1.00	Reference	1.00	Reference	1.00	Reference
Female	1.02	0.93–1.11	0.94	0.87–1.03	0.84	0.76–0.94
Unknown	1.16	0.23–5.79	1.16	0.29–4.55	1.21	0.22–6.78
Birth order						
1	1.00	Reference	1.00	Reference	1.00	Reference
≥2	1.06	0.98–1.15	0.88	0.82–0.96	0.92	0.83–1.03
Race/ethnicity						
Non-Hispanic White	1.00	Reference	1.00	Reference	1.00	Reference
Non-Hispanic Black	2.19	1.91–2.51	1.74	1.47–2.06	2.33	1.78–3.06
Hispanic	0.92	0.80–1.07	1.13	0.97–1.31	1.13	0.93–1.37
Non-Hispanic mixed race	1.01	0.82–1.25	0.97	0.78–1.19	0.94	0.73–1.22
Other	0.88	0.68–1.12	1.10	0.82–1.48	1.14	0.77–1.66
Nativity/immigrant status						
Immigrant parents, foreign-born child	1.72	1.18–2.51	0.68	0.46–1.01	0.63	0.41–0.96
Both immigrant parents, US-born child	1.00	Reference	1.00	Reference	1.00	Reference
1 immigrant parent, US-born child	1.20	0.90–1.61	1.10	0.86–1.40	0.94	0.71–1.25
US-born parents, US-born child	2.03	1.63–2.54	1.43	1.17–1.76	1.32	1.02–1.72
Household composition						
2 parents, biological	1.00	Reference	1.00	Reference	1.00	Reference
2 parents, step family	1.81	1.41–2.32	1.75	1.32–2.32	1.80	1.21–2.68
Single mother	1.33	1.18–1.50	1.46	1.27–1.68	1.54	1.27–1.89
Other family type	3.22	1.52–6.84	1.28	0.71–2.30	0.92	0.49–1.76
Unknown	5.44	2.34–12.66	3.24	1.60–6.56	3.55	1.53–8.25
Place of residence						
Metropolitan	1.00	Reference	1.00	Reference	1.00	Reference
Nonmetropolitan	1.41	1.28–1.55	1.41	1.27–1.56	1.37	1.19–1.59
Unknown	1.01	0.92–1.11	0.98	0.90–1.07	1.01	0.90–1.12
Highest parental education level, y						
<12	1.79	1.47–2.19	1.34	1.08–1.68	0.98	0.75–1.28
12	2.27	2.05–2.52	2.04	1.81–2.29	1.71	1.45–2.00
≥13	1.00	Reference	1.00	Reference	1.00	Reference
Unknown	1.67	0.93–3.01	0.98	0.59–1.63	1.25	0.61–2.54
Household poverty status (ratio of family income to poverty threshold)						
<100%	1.87	1.60–2.18	1.41	1.20–1.66	0.97	0.78–1.21
100%–200%	1.68	1.47–1.91	1.33	1.17–1.52	0.89	0.75–1.06
200%–400%	1.32	1.18–1.48	1.15	1.04–1.28	0.94	0.82–1.08
≥400%	1.00	Reference	1.00	Reference	1.00	Reference
Unknown	1.38	1.17–1.63	1.12	0.95–1.33	0.88	0.71–1.10
Neighborhood safety						
Safe	1.00	Reference	1.00	Reference	1.00	Reference
Unsafe	1.08	0.95–1.23	0.93	0.82–1.07	1.00	0.83–1.19
Unknown	0.81	0.52–1.26	0.67	0.41–1.10	0.70	0.38–1.31
Familial or social support						
0 (low)	1.59	1.20–2.12	2.26	1.60–3.21	1.69	1.05–2.73
1	1.46	1.20–1.77	1.51	1.21–1.88	1.43	1.04–1.95
2	1.32	1.13–1.53	1.43	1.23–1.68	1.53	1.23–1.89
3	1.27	1.11–1.46	1.42	1.24–1.62	1.25	1.05–1.49
4–6	1.25	1.12–1.40	1.19	1.07–1.33	1.12	0.98–1.29
≥7 (high)	1.00	Reference	1.00	Reference	1.00	Reference
Unknown	1.00	0.45–2.25	0.94	0.38–2.32	1.12	0.45–2.80
Maternal physical health status						
Excellent/very good/good	1.00	Reference	1.00	Reference	1.00	Reference
Fair/poor	0.99	0.82–1.19	0.99	0.80–1.22	0.88	0.65–1.18
Unknown	0.08	0.02–0.34	0.56	0.18–1.69	0.26	0.09–0.78
Maternal emotional health status						
Excellent/very good/good	1.00	Reference	1.00	Reference	1.00	Reference
Fair/poor	1.02	0.82–1.26	0.93	0.73–1.19	0.82	0.60–1.13
Unknown	5.84	1.69–20.19	1.18	0.41–3.42	1.92	0.66–5.60

TABLE 2 Continued

Characteristic	Not Ever Breastfeeding		Not for At Least 6 mo		Not for At Least 12 mo	
	Odds Ratio ^{a,b}	95% Confidence Interval	Odds Ratio ^{a,b}	95% Confidence Interval	Odds Ratio ^{a,b}	95% Confidence Interval
Maternal exercise						
Physically active	1.00	Reference	1.00	Reference	1.00	Reference
Physically inactive	1.06	0.97–1.16	1.14	1.04–1.24	1.07	0.95–1.20
Unknown	1.34	0.60–3.00	1.65	0.90–3.02	2.44	1.23–4.85
Household smoking status						
Smoker	1.74	1.54–1.95	2.08	1.83–2.37	1.90	1.57–2.30
Nonsmoker	1.00	Reference	1.00	Reference	1.00	Reference
Unknown	1.12	1.02–1.23	1.19	1.08–1.30	1.08	0.96–1.21

^a Adjusted for gender, birth order, race/ethnicity, immigrant status, household composition, place of residence, household poverty status, neighborhood safety, familial support, maternal physical and emotional health, maternal exercise, and household smoking.

^b In estimating the adjusted effects, either parental education or poverty status was used to avoid the problem of colinearity.

below the poverty threshold had 87% higher odds of never breastfeeding and a 41% higher odds of not breastfeeding at 6 months.

Table 3 presents observed breastfeeding initiation and duration rates and adjusted odds for various immigrant groups stratified by race/ethnicity and SES. These stratified rates reflect to some degree the possible impact on breastfeeding of acculturation for various ethnic and social groups. Ever-breastfeeding rates varied greatly among the 12 ethnic-immigrant groups, from a low of 48% for native black children with native parents to a high of ~88% among immigrant black and white children. Although for each racial/ethnic group, children born to 1 or both foreign-born parents (the overall immigrant group) had significantly higher breastfeeding rates than native children born to native parents, the impact of acculturation was most consistent among Hispanic women. Native Hispanic children with native parents and US-born Hispanic children with 1 foreign-born parent were the 2 most acculturated groups, with significantly lower breastfeeding initiation and shorter duration rates than the least acculturated and the newest immigrant group consisting of immigrant Hispanic children with foreign-born parents.

Marked ethnic-nativity differentials in the odds of not breastfeeding can be noted even after controlling for the relevant covariates. Compared with immigrant Hispanic children with foreign-born parents (presumably the least acculturated group), the odds of never breastfeeding were respectively 2.4, 2.9, 6.5, and 2.4 times higher for native children with native parents (presumably the most acculturated group) of Hispanic, white, black, and other ethnicities. Ethnic-nativity differentials in breastfeeding duration were even greater than those in breastfeeding initiation. Compared with immigrant Hispanic children with foreign-born parents, the odds of not breastfeeding at 6 months were respectively 3.7, 3.6, 6.4, and 2.9 times higher for native children with native parents of Hispanic, white, black, and other ethnicities.

Regarding the joint effect of nativity and SES, ever-

breastfeeding rates varied substantially from a low of 55% for the poor native children with native parents and 43% for affluent immigrant children with foreign-born parents to a high of 94% for the affluent US-born children with both immigrant parents. Breastfeeding rates at 6 months were lowest among the poor native children with native parents (23%) and highest among affluent US-born children with both immigrant parents (53%) and poor immigrant children with immigrant parents (64%). Although higher household income was generally associated with higher breastfeeding rates for the 2 most acculturated nativity groups, higher income was related to lower breastfeeding rates among the least acculturated or the most recent immigrant group. Conversely, within the most deprived income group, breastfeeding rates declined with increasing levels of acculturation, whereas within the most affluent stratum, the least acculturated group had lower breastfeeding rates than the more acculturated groups. Compared with the affluent US-born children with both foreign-born parents, the adjusted odds of never breastfeeding were respectively 5.8, 5.1, 3.9, and 3.0 times higher for native children with native parents in the most deprived to the most affluent groups.

DISCUSSION

To our knowledge, this is one of the largest US studies that has examined the impact of nativity/immigrant status, race/ethnicity, and key socioeconomic determinants on breastfeeding initiation and duration, using a nationally representative sample of 33 121 children. Unlike previous studies,^{5,7,8,21} this study defines immigrant status on the basis of both parental nativity and nativity status of children.⁹ This definition allows one to also assess the impact of acculturation, albeit indirectly, on breastfeeding. Another unique aspect of the study involves assessing differential effects of immigrant status across various racial/ethnic and socioeconomic groups.

Although a number of studies have shown substantial immigrant and US-born disparities in infant, child, and

TABLE 3 Joint Effects of Nativity/Immigrant Status With Race/Ethnicity and Household Socioeconomic Status on Breastfeeding Initiation and Duration: The 2003 NSCH

Joint Effects	Ever Breastfed		Not Ever Breastfeeding		Breastfeeding Rate at 6 mo		Not Breastfeeding for at Least 6 mo	
	Rate	SE	Odds Ratio ^a	95% Confidence Interval	Rate	SE	Odds Ratio ^a	95% Confidence Interval
Nativity status, race/ethnicity								
Hispanic								
Immigrant parents, foreign-born child	85.5	3.3	1.00	Reference	63.1	5.2	1.00	Reference
Both immigrant parents, US-born child	83.5	1.5	1.47	0.84–2.58	44.6	2.3	2.85	1.72–4.71
1 immigrant parent, US-born child	76.9	2.9	2.50	1.36–4.62	34.7	3.5	4.73	2.69–8.31
US-born parents, US-born child	71.5	1.6	2.38	1.38–4.11	32.3	1.8	3.74	2.26–6.19
Non-Hispanic white								
1 or both immigrant parents ^b	88.4	1.2	1.34	0.75–2.40	59.0	2.4	1.92	1.15–3.20
US-born parents, US-born child	74.0	0.5	2.87	1.69–4.86	39.0	0.6	3.63	2.25–5.86
Non-Hispanic black								
1 or both immigrant parents ^b	87.4	3.3	1.28	0.59–2.78	47.4	5.8	2.94	1.51–5.69
US-born parents, US-born child	47.9	1.6	6.52	3.81–11.17	21.3	1.4	6.38	3.87–10.55
All other								
Immigrant parents, foreign-born child	57.9	8.8	6.80	2.69–17.21	31.2	9.8	5.59	2.02–15.49
Both immigrant parents, US-born child	89.5	2.5	1.25	0.60–2.58	41.4	4.9	3.99	2.12–7.48
1 immigrant parent, US-born child	88.8	2.5	1.22	0.59–2.51	54.1	5.4	2.14	1.09–4.20
US-born parents, US-born child	70.8	1.9	2.39	1.37–4.17	37.5	2.4	2.90	1.72–4.90
Nativity status, household education								
Parental education <13 y								
Immigrant parents, foreign-born child	90.5	2.7	0.99	0.48–2.06	69.7	5.4	0.33	0.18–0.59
Both immigrant parents, US-born child	82.1	1.8	2.43	1.58–3.72	43.9	2.6	1.21	0.87–1.71
1 immigrant parent, US-born child	77.7	3.1	2.88	1.76–4.73	35.2	4.5	1.72	1.08–2.74
US-born parents, US-born child	53.5	1.0	5.41	3.80–7.71	20.7	0.9	2.59	1.93–3.46
Parental education ≥13 y								
Immigrant parents, foreign-born child	66.4	4.4	5.07	3.09–8.34	41.6	5.3	1.33	0.81–2.17
Both immigrant parents, US-born child	90.6	1.4	1.00	Reference	49.6	3.0	1.00	Reference
1 immigrant parent, US-born child	86.5	1.5	1.49	0.97–2.28	50.9	2.3	0.95	0.70–1.30
US-born parents, US-born child	77.2	0.5	2.37	1.68–3.34	42.5	0.6	1.21	0.92–1.59
Nativity status, household poverty status								
Below poverty level								
Immigrant parents, foreign-born child	87.8	4.7	1.54	0.55–4.30	63.6	7.4	0.41	0.19–0.92
Both immigrant parents, US-born child	83.7	2.2	2.80	1.44–5.43	44.2	3.6	1.30	0.77–2.22
1 immigrant parent, US-born child	73.6	5.8	4.41	1.94–10.06	40.1	7.4	1.42	0.68–2.98
US-born parents, US-born child	54.8	1.5	5.80	3.23–10.44	22.8	1.4	2.12	1.33–3.38
100%–200% of poverty level								
Immigrant parents, foreign-born child	85.7	4.8	2.05	0.82–5.14	36.9	9.9	1.63	0.61–4.33
Both immigrant parents, US-born child	82.2	2.9	3.12	1.55–6.25	46.7	3.6	1.19	0.70–2.02
1 immigrant parent, US-born child	83.8	2.7	2.34	1.16–4.71	42.3	4.9	1.37	0.76–2.47
US-born parents, US-born child	63.5	1.2	5.05	2.82–9.02	30.1	1.2	1.84	1.17–2.89
200% to 400% of poverty level								
Immigrant parents, foreign-born child	64.8	8.8	8.56	3.38–21.68	51.7	10.8	1.08	0.41–2.89
Both immigrant parents, US-born child	86.8	3.1	1.92	0.87–4.20	44.0	4.9	1.36	0.76–2.43
1 immigrant parent, US-born child	81.9	2.9	2.88	1.44–5.74	45.8	3.7	1.29	0.77–2.18
US-born parents, US-born child	73.6	0.7	3.86	2.17–6.88	38.7	0.9	1.55	1.00–2.42

TABLE 3 Continued

Joint Effects	Ever Breastfed		Not Ever Breastfeeding		Breastfeeding Rate at 6 mo		Not Breastfeeding for at Least 6 mo	
	Rate	SE	Odds Ratio ^a	95% Confidence Interval	Rate	SE	Odds Ratio ^a	95% Confidence Interval
≥400% of poverty level								
Immigrant parents, foreign-born child	42.7	6.6	20.22	9.48–43.11	32.9	6.7	2.48	1.23–5.03
Both immigrant parents, US-born child	93.6	1.7	1.00	Reference	53.3	4.9	1.00	Reference
1 immigrant parent, US-born child	90.9	1.5	1.35	0.68–2.67	52.2	3.3	1.04	0.63–1.71
US-born parents, US-born child	80.9	0.7	2.97	1.67–5.29	45.6	1.0	1.35	0.87–2.09

^a Adjusted for gender, birth order, race/ethnicity, household composition, place of residence, household poverty status, neighborhood safety, familial support, maternal physical and emotional health, maternal exercise, and household smoking status.

^b This is the overall immigrant category consisting of children born to 1 or both foreign-born parents.

adult health status and health behaviors,^{10,22,23} studies showing nativity differentials in US breastfeeding prevalence are relatively rare.^{7,8,21} The studies that have examined nativity differentials in breastfeeding have generally focused on certain geographic regions such as Texas, California, and Massachusetts.^{7,8,21} Most of these studies are limited in their investigation of ethnic-nativity patterns because they have used only a few ethnic groups such as non-Hispanic whites, blacks, and Hispanics. Our study, on the other hand, used a large nationally representative sample to explore breastfeeding patterns among 12 ethnic-nativity groups with varying levels of acculturation. In addition, ours is the first known study to examine the joint effect of nativity and household SES.

The major finding of the study was that immigrant women in each racial/ethnic group had higher breastfeeding initiation and longer duration rates than native women, even after controlling for socioeconomic and demographic differences. The ethnic-immigrant differences may partly reflect cultural norms regarding breastfeeding practices that are prevalent in their countries of origin. Socioeconomic factors, such as higher household education and income levels, are particularly important in predicting increased breastfeeding rates among native women; however, they tend to have a negative effect on breastfeeding initiation and duration among recent immigrant women.

Marked racial/ethnic and socioeconomic disparities in breastfeeding prevalence shown here are consistent with those observed previously.^{2–5} Lower breastfeeding prevalence has been noted for black children, and substantial inverse socioeconomic gradients have been observed for the United States and other industrialized countries.^{2–5,21,24} Consistent with our findings, previous studies have observed a higher likelihood of breastfeeding associated with increased levels of social support.^{18,19} Lower odds of breastfeeding associated with increased levels of acculturation in the general population and among Hispanic women have been observed previously, another finding consistent with our study.^{8,21,25–27}

This study has certain limitations. First, the NSCH lacked data on exclusive breastfeeding, which is important in terms of conferred health benefits of breastfeeding. Second, our analysis of immigrant and acculturation patterns is limited by the fact that the survey lacked data on such key variables as the length of immigration, citizenship, naturalization, and legal status.^{9,10} Asian Americans account for more than a quarter of the US immigrant population, and not having data on them for the entire sample limits nativity analyses for Asians. Furthermore, the survey did not identify specific Hispanic and Asian subgroups, which are extremely heterogeneous in their socioeconomic, behavioral, and health characteristics.^{9,10,22,23} Future research needs to focus on whether Mexican women differ in their breastfeeding behaviors from Cuban, Puerto Rican, and Central and South American women and whether breastfeeding patterns differ markedly among Chinese, Japanese, Filipino, Asian Indian, Korean, Vietnamese, and Pacific Islander women.

In this study, breastfeeding data were derived from retrospective reports. Assessment of the accuracy of maternal recall of breastfeeding practices is mixed,^{28–30} but when asked within 3 years, maternal recall of breastfeeding initiation and duration was found to be both reliable and valid.²⁸ Breastfeeding data in the NSCH were obtained for children <6 years of age at the time of the interview, and information was reported not only by biological mothers, but also by step, adoptive, or foster mothers, as well as by other primary caregivers, some of whom may be less knowledgeable about the duration the child was breastfed or fed breast milk. Thus, misclassification in breastfeeding practices is possible in our study.

Other limitations of our study include the unavailability of data in the NSCH on maternal age, infant's health at birth (eg, gestational age and birth weight), child's age in months on the public use file (the lack of which yields slightly underestimated duration-specific breastfeeding rates), maternal employment status, prenatal and postpartum maternal nutrition status mea-

tures such as weight and BMI, many of which could potentially affect a woman's odds of breastfeeding initiation and decision to breastfeed for a longer duration^{3,5,7,17,18} and may partly account for the ethnic-immigrant and socioeconomic differentials in breastfeeding prevalence reported here.

CONCLUSIONS

Immigrant women in each racial/ethnic group had higher breastfeeding initiation and longer duration rates than native women. Acculturation seems to have a particularly detrimental impact on the breastfeeding behavior of Hispanic women, but it also negatively affects breastfeeding practices of non-Hispanic women. Breastfeeding rates at 6 months for most acculturated ethnic and socioeconomic groups fall well below the national goal of 50%.^{1,31} Health education programs designed to promote initiation and continuation of breastfeeding should target acculturated women across all ethnic and socioeconomic strata and also newer, affluent immigrant women, as well as other high-risk populations, such as rural women and those with lower levels of SES and social support.

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