



Magazine

Breastfeeding trends and updated national health objectives for exclusive breastfeeding--United States, birth years 2000-2004.(Table)(Survey)

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Breastfeeding is associated with decreased risk for many early-life diseases and conditions, including otitis media, respiratory tract infections, atopic dermatitis, gastroenteritis, type 2 diabetes, sudden infant death syndrome, and obesity (1). Breastfeeding also is associated with health benefits to women, including decreased risk for type 2 diabetes, ovarian cancer, and breast cancer (1). Exclusive breastfeeding is defined as an infant receiving only breast milk and no other liquids or solids except for drops or syrups consisting of vitamins, minerals, or medicines (2). In 2007, Healthy People 2010 (HP2010) objectives for breastfeeding initiation and duration were updated to include two new objectives on exclusive breastfeeding (i.e., to increase the proportion of mothers who exclusively breastfeed their infants through age 3 months to 60% and through age 6 months to 25% [objectives 16-19d and 16-19e]) (3). To monitor progress toward achieving HP2010 breastfeeding objectives, CDC analyzed data from the National Immunization Survey (NIS). This report describes the results of that analysis, which indicated that rates for breastfeeding initiation and duration increased among infants born during 2000-2004. Rates for exclusive breastfeeding through ages 3 months and 6 months among infants born in 2004 were 30.5% and 11.3%, respectively, below targets set by HP2010. Rates of exclusive breastfeeding were significantly lower among black infants (compared with white infants) and infants born to unmarried mothers (compared with married mothers). Additionally, older age, urban residence, higher education, and higher income of mothers all were positively associated with exclusive breastfeeding. Further research is needed to identify successful programs and policies to support exclusive breastfeeding, especially among subgroups with the lowest rates.

NIS is a random-digit-dialed telephone survey conducted annually by CDC to obtain national, state, and selected urban area estimates of vaccination rates among U.S. children aged 19-35 months. (Additional information about NIS methods is available at <http://www.cdc.gov/nis>.) NIS is designed to collect nationally representative data regarding the noninstitutionalized, U.S. civilian population. Telephone interviews are conducted with the adult household member most knowledgeable regarding the child's vaccination history to collect data about the child, mother, and household. The overall interview response rates, defined by the Council of American Survey and Research Organizations, for NIS years 2001-2006 were consistently above 64% (range: 64.5%-76.1%). Questions on breastfeeding initiation and duration and exclusive breastfeeding were first added to NIS in the third quarter of 2001. Early postpartum breastfeeding (i.e., initiation of breastfeeding) was defined by a positive response to the question, "Was [child's name] ever breastfed or fed breast milk?" Breastfeeding at ages 6 months and 12 months (i.e., duration of breastfeeding) was further defined by responses to the question, "How long was [child's name] breastfed or fed breast milk?" The wording of this question changed slightly in 2006 (Table 1) but did not substantially affect responses. Although questions used to determine duration of exclusive breastfeeding have been included in NIS since 2001, in 2006, revised questions based on results of cognitive testing (CDC, unpublished data, 2005) resulted in substantially lower rates of exclusive breastfeeding than in previous years.

Because data included in this analysis are for children aged 19-35 months at the time of the NIS interview, each cross-sectional survey includes children from birth cohorts that span 3 calendar years. The 2006 NIS, for example, includes children born from February 2003 through May 2005. To monitor progress toward achieving the HP2010 objectives, data from the 2001-2006 surveys were combined, and breastfeeding data were analyzed by year of birth during 2000-2004 (i.e., birth year cohort) rather than by survey year (4). Therefore, each birth year cohort represents data collected over 3 survey years. Sample sizes ranged from 12,388 for the 2000 birth cohort to 29,256 for the 2003 birth cohort. The sample size for the 2000 birth cohort was substantially smaller than that for other years because breastfeeding questions were asked only of a sample of all NIS respondents during the first 18 months after breastfeeding questions were added to NIS.

Among infants born in 2000, breastfeeding rates for the early postpartum period,* 6 months, and 12 months were 70.9% (95% confidence interval [CI] = 69.0%-72.8%), 34.2% (CI = 32.2%-36.2%), and 15.7% (CI = 14.2% -17.2%), respectively. For infants born in 2004, these rates had consistently increased to 73.8% (CI = 72.8% - 74.8%),

41.5% (CI = 40.4%-42.6%), and 20.9% (CI = 20.0% -21.8%), respectively (Figure). Based on the revised questions, rates for exclusive breastfeeding through ages 3 and 6 months were 30.5% and 11.3%, respectively, among infants born in 2004 (Table 2).

[FIGURE OMITTED]

Disparities were observed in rates of exclusive breastfeeding among infants born in 2004. Rates of exclusive breastfeeding through age 3 months were lowest among black infants (19.8%) and among infants of mothers who were aged <20 years (16.8%), had a high school education or less (22.9% and 23.9%, respectively), were unmarried (18.8%), resided in rural areas (23.9%), and had an income-to-poverty ratio of <100% (23.9%) (Table 2).

Editorial Note: The findings in this report indicate that although progress is being made toward achieving the HP2010 objectives for breastfeeding initiation and duration, rates of exclusive breastfeeding are below desired levels, especially among black infants and those born to women who are young, unmarried, have lower incomes, are less educated, or who live in rural areas. Previous research has indicated that less education and lower socioeconomic status are associated with lower rates of breastfeeding among all racial/ethnic groups; however, black women across all sociodemographic variables consistently had lower rates of breastfeeding than white and Mexican-American women (5). Lower rates of breastfeeding among black women have been attributed to several factors, such as economic pressures to return to work environments that do not support breastfeeding, lack of breastfeeding education and supportive social networks, aggressive marketing by formula manufacturers, and cultural environments that do not value breastfeeding or promote positive images of breastfeeding women (6). However, successful interventions such as the Baby Friendly Hospital Initiative, [dagger] in which hospitals adopt 10 practices that support breastfeeding as outlined by UNICEF and the World Health Organization (WHO), have resulted in increases in rates of both overall and exclusive breastfeeding among black women and other subgroups with the lowest breastfeeding rates (7). Increasing exclusive breastfeeding rates is a critical public health strategy to improve infant health outcomes among populations at high risk.

The NIS breastfeeding rates described in this report are different from those reported by the Ross Mothers Survey (RMS), the data source used to set and monitor the HP2010 objectives for breastfeeding initiation and duration (8). Exclusive breastfeeding, as defined by WHO (2), is not measured by RMS. The in-hospital breastfeeding rate from RMS was 68.4% in 2000, 70.1% in 2002, and 64.7% in 2004 (8). In contrast, early postpartum NIS breastfeeding rates steadily increased during those years. RMS is administered by mail, and historically low response rates continue to decline; a recent RMS publication reports a response rate of 28% (9). Ross Laboratories, which conducts the RMS, manufactures infant formula, and breastfeeding practices of RMS respondents might be different from those of NIS respondents. Further examination of the differences between NIS and RMS is needed.

The findings in this report are subject to at least four limitations. First, breastfeeding behavior was based on retrospective self-report by mothers or other caregivers, whose responses might be subject to recall bias. Maternal recall is a valid and reliable method for estimating breastfeeding initiation and duration (10). However, NIS respondents include other types of caregivers, and their recall might not be as valid or reliable as that of mothers. Second, the NIS question that defines early postpartum breastfeeding or initiation, "Was [child's name] ever breastfed or fed breast milk?" collects information that might differ from the HP2010 objective (16-19a) for initiation, defined as in-hospital breastfeeding before discharge; RMS uses in-hospital rates to measure breastfeeding initiation. Breastfeeding is time-sensitive, and duration of breastfeeding is influenced by initiation during the first few hours and days of life (7). Measurement of breastfeeding initiation using questions regarding whether an infant ever received breast milk is likely a valid proxy. Third, although survey data were weighted to make them representative of all U.S. children aged 19-35 months, some bias might remain. Finally, accurate trend analysis of exclusive breastfeeding is not yet possible because data collected using the improved 2006 questions resulted in significantly lower rates of exclusive breastfeeding for the 2004 birth cohort than for previous birth cohorts.

Compared with breastfeeding combined with formula feeding, exclusive breastfeeding provides more protection against lower respiratory tract infections, acute otitis media, atopic dermatitis, and childhood obesity (1). The American Academy of Pediatrics and other health organizations recommend that mothers exclusively breastfeed their infants for the first 6 months of life, with continuation of breastfeeding through age 12 months and beyond as other foods are introduced (1). To increase exclusive breastfeeding rates and decrease disparities in breastfeeding initiation and duration and exclusive breastfeeding among subgroups such as black women, more research is needed regarding factors that influence breastfeeding decisions. As outlined in the U.S. Department of Health and Human Services Blueprint for Action on Breastfeeding, [section] such factors include maternity care practices, interactions with health-care professionals, and workplace support. To help states assess their progress in addressing these factors, CDC's Division of Nutrition, Physical Activity, and Obesity created the

Breastfeeding Report Card, [paragraph] which links process and outcome measures of eight indicators important to breastfeeding support, including progress toward all five HP2010 breastfeeding objectives. Among all sociodemographic groups, identification and implementation of successful practices and programs that increase rates of breastfeeding (particularly rates of exclusive breastfeeding through 6 months) are paramount to achieving these breastfeeding objectives.

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* In-hospital period, before discharge.

[dagger] Available at <http://www.babyfriendlyusa.org/eng/index.html>.

[section] Available at <http://www.cdc.gov/breastfeeding/pdf/bluprntbk2.pdf>.

[paragraph] Available at http://www.cdc.gov/breastfeeding/data/report_card.htm.

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TABLE 1. Changes in breastfeeding questions--National Immunization Survey, 2001-2006

Original questions	Revised questions (2006)
1. Was [child's name] ever breastfed or fed breast milk?	1. Question remained unchanged.
2. How long was [child's name] when breastfed or fed breast milk?	2. How old was [child's name] when [child's name] completely stopped breastfeeding or being fed breast milk?
3. How old was [child's name]?	3. How old was [child's name]?

when s/he was first fed something when (he/she) was first fed other than breast milk or water? * formula? ([dagger]) This includes formula, juice, cow's milk, sugar water, solid 4. This next question is about the foods, or anything else. first thing that [child's name] was given other than breast milk or formula. Please include juice, cow's milk, sugar water, baby food, or anything else that [child's name] may have been given, even water. How old was [child's name] when (he/she) was first fed anything other than breast milk or formula?

* In 2004, "or water" was removed from the first part of the question and placed in the list of items after "cow's milk:"

([dagger]) Question 3 (revised from original) and question 4 (new in 2006) replaced the original question 3.

TABLE 2. Estimated percentage of infants born in 2004 who were exclusively breastfed" through ages 3 and 6 months, by selected sociodemographic characteristics--National Immunization Survey, United States

Exclusive breastfeeding through age 3 mos	
Characteristic (%) (95% CI ([section]))	
U.S. overall (N = 17,654 ([dagger]))	(30.5) (29.4-31.6)
Sex	
Male (30.7)	(29.1-32.3)
Female ([paragraph])	(30.3) (28.7-31.9)
Race/Ethnicity (child)	
Hispanic (30.8)	(28.3-33.3)
White, non-Hispanic ([paragraph])	(33.0) (31.6-34.4)
Black, non-Hispanic (19.8) **	(17.0-22.6)
Asian, non-Hispanic (30.6)	(25.0-36.2)
Other race, non-Hispanic (29.3)	(24.9-33.7)
([dagger][dagger])	
Age of mother at child's birth (yrs)	
<20 (16.8) **	(10.3-23.3)
20-29 (26.2) **	(24.4-28.0)
[greater than or equal to]30 (34.6)	(33.2-36.0)
([paragraph])	
Education	
Less than high school (23.9) **	(21.0-26.8)
High school (22.9) **	(20.9-24.9)
Some college (32.8) **	(30.3-35.3)
College graduate ([paragraph])	(41.5) (39.7-43.3)
Marital status	
Married ([paragraph])	(35.4) (34.0-36.8)
Unmarried (18.8) **	(16.9-20.7)
Residence	
MSA, ([section][section]) central (30.7)	(29.0-32.4)
city ([paragraph])	
MSA, non-central city (32.8)	(30.9-34.7)
Non-MSA (23.9) **	(21.8-26.0)
Income-to-poverty ratio (%) ([paragraph][paragraph])	
<100 (23.9) **	(21.6-26.2)
100-184 (26.6) **	(23.8-29.4)
185-349 (33.2) **	(30.9-35.5)
[greater than or equal to] 350 (37.7)	(35.7-39.7)
([paragraph])	
Exclusive breastfeeding through age 6 mos	

Characteristic (%) (95% CI)

U.S. overall

(N = 17,654 ([dagger])) (11.3) (10.5-12.1)

Sex

Male (10.8) (9.8-11.8)

Female ([paragraph]) (11.7) (10.5-12.9)

Race/Ethnicity (child)

Hispanic (11.5) (9.7-13.3)

White, non-Hispanic ([paragraph])(11.8) (10.9-12.7)

Black, non-Hispanic (7.3) ** (5.5-9.1)

Asian, non-Hispanic (14.5) (10.0-19.0)

Other race, non-Hispanic (12.2) (9.2-15.2)

([dagger][dagger])

Age of mother at child's birth (yrs)

<20 (6.1) ** (1.5-10.7)

20-29 (8.4) ** (7.3-9.5)

[greater than or equal to]30 (13.8) (12.7-14.9)

([paragraph])

Education

Less than high school (9.1) ** (7.1-11.1)

High school (8.2) ** (7.0-9.4)

Some college (12.3) ** (10.2-14.4)

College graduate ([paragraph]) (15.4) (14.1-16.7)

Marital status

Married ([paragraph])(13.4) (12.4-14.4)

Unmarried (6.1) ** (5.0-7.2)

Residence

MSA, ([section][section]) central(11.7) (10.5-12.9)
city ([paragraph])

MSA, non-central city(12.1) (10.8-13.4)

Non-MSA (8.2) ** (6.9-9.5)

Income-to-poverty ratio (%) ([paragraph][paragraph])

<100 (8.3) ** (6.9-9.7)

100-184 (8.9) ** (7.2-10.6)

185-349 (11.8) ** (10.3-13.3)

[greater than or equal to] 350 (14.0) (12.6-15.4)

([paragraph])

* Defined as an infant receiving only breast milk and no other liquids or solids except for drops or syrups consisting of vitamins, minerals, or medicines.

([dagger]) Weighted sample.

([section]) Confidence interval.

([paragraph]) Referent group.

** p<0.05 by chi-square test, compared with the referent group.

([dagger][dagger]) Includes American Indian/Alaska Native,
Native

Hawaiian, other Pacific Islander, and multiple race.

([section][section]) Metropolitan statistical area, defined by
the

U.S. Census Bureau.

([paragraph][paragraph]) Ratio of self-reported family income to
the federal threshold value, defined by the U.S. Census Bureau.

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