

Breastfeeding Advice Given to African American and White Women by Physicians and WIC Counselors

ANNE C. BEAL, MD, MPH^a
KAREN KUHLTHAU, PhD^b
JAMES M. PERRIN, MD^b

SYNOPSIS

Objective. This study determined rates of breastfeeding advice given to African American and white women by medical providers and WIC nutrition counselors, and sought to determine whether racial differences in advice contributed to racial differences in rates of breastfeeding.

Methods. The study used data from the 1988 National Maternal and Infant Health Survey, a cross-sectional survey of a nationally representative sample of mothers with a live birth, infant death, or fetal death in 1988. The authors compared white women ($n=3,966$) and African American women ($n=4,791$) with a live birth in 1988 on self-reported rates of medical provider and WIC advice to breastfeed, WIC advice to bottlefeed, and breastfeeding.

Results. Self-reported racial identification did not predict medical provider advice. However, being African American was associated with less likelihood of breastfeeding advice and greater likelihood of bottlefeeding advice from WIC nutrition counselors. In multivariate analyses controlling for differences in advice, being African American was independently associated with lower breastfeeding rates (odds ratio [OR] = 0.41, 95% CI 0.32, 0.52).

Conclusions. African American women were less likely than white women to report having received breastfeeding advice from WIC counselors and more likely to report having received bottlefeeding advice from WIC counselors. However, African American and white women were equally likely to report having received breastfeeding advice from medical providers. Lower rates of breastfeeding advice from medical or nutritional professionals do not account for lower rates of breastfeeding among African American women.

^aCommonwealth Fund, New York, NY

^bCenter for Child and Adolescent Health Policy, Massachusetts General Hospital and Harvard Medical School, Boston, MA

Address correspondence to: Anne C. Beal, MD, MPH, Commonwealth Fund, One East 75th St., New York, NY 10021; tel. 212-606-3854; fax 212-249-1276; e-mail <acb@cmwf.org>.

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Breastfed infants have lower rates of asthma,^{1,2} gastroenteritis,³⁻⁵ and otitis media^{1,3,6-9} and better vaccine response than non-breastfed infants.¹⁰ In addition to better bonding with mothers,¹¹ breastfed infants as a group have higher levels of development and intelligence.^{12,13} Finally, breast milk may protect against SIDS.¹⁴⁻¹⁶ Given the advantages of breastfeeding, the U.S. Public Health Service has established a breastfeeding goal of 75% for all newborns by 2010,¹⁷ and organizations such as the American Academy of Pediatrics recommend breast milk as the preferred source of infant nutrition.^{18,19}

Despite the benefits of breastfeeding, African American women are less likely to breastfeed their infants than white women.^{20,21} Partly as a result, the U.S. Public Health Service has prioritized breastfeeding promotion among minority women to meet the Healthy People 2010 goal.¹⁷ Disparities between African American and white infant morbidity and mortality are well known,²² and Forste et al. have shown that lower breastfeeding rates are a significant contributor to national disparities in infant mortality.²³ Thus, promotion of this infant feeding option is especially important for African American infants.

Counseling from medical professionals can promote many types of health behaviors. Prenatal breastfeeding advice from physicians, nurses, and Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) nutrition counselors has been shown to increase rates of breastfeeding.²⁴⁻²⁶ However, little work has been done to determine if there are racial differences in the likelihood of receiving prenatal breastfeeding advice from health professionals, or if differences in rates of advice can account for the observed differences in breastfeeding between African American and white women.²⁷

The purposes of this study were to explore (a) the rates of prenatal breastfeeding advice given to African American and white women by medical professionals and WIC counselors, (b) the degree to which breastfeeding advice from medical and nutritional professionals is associated with higher rates of breastfeeding for these two groups of women, and (c) whether differences in breastfeeding advice partly account for the observed racial differences in breastfeeding rates.

METHODS

Sample

We analyzed data from the 1988 National Maternal and Infant Health Survey (NMIHS),²⁸ the only national survey collecting data on breastfeeding behaviors and prenatal breastfeeding advice. The survey identified factors related to poor pregnancy outcomes in a

nationally representative sample of mothers with a live birth, infant death, or fetal death in 1988. The survey oversampled low birthweight and African American infants to obtain adequate numbers for special analyses of infant mortality.²⁸ We limited our analyses to data on white ($n = 3,966$) and African American ($n = 4,791$) survey participants who had live births in 1988.

Measures

Provider advice. The medical provider advice variable was a measure that asked respondents whether, during their prenatal care, they had been advised to try breastfeeding. We categorized those who responded “yes” as receiving provider advice to breastfeed. There were no questions regarding who gave the advice, thus, no distinction could be made between types of medical providers, such as physicians, midwives, and nurses.

WIC advice. We limited the WIC advice analyses to women who participated in the WIC program while they were pregnant, including 802/3,966 (20%) of white respondents and 2,608/4,791 (54%) of African American respondents. Respondents were asked if their WIC counseling included advice to breastfeed or bottlefeed their infants.

The NMIHS includes no questions on the content or amount of advice received from medical providers or WIC counselors or on whether medical providers advised respondents to bottlefeed.

Race. We derived the race variables of “white” and “African American” from questions in which respondents self-identified their racial/ethnic categorizations. They were first asked if they were of Spanish/Hispanic ancestry; we excluded those who responded “yes” from the analyses. Women were next asked which group best described their racial background. We excluded respondents who did not identify themselves as either “white” or “black.”

Breastfeeding. We defined breastfeeding as the mother ever having breastfed her infant, regardless of the length of time. We conducted analyses using the “ever breastfed” variable as well as breastfeeding at various times post-partum and found that the observed differences by race did not change with differences in the choice of breastfeeding variable. Because breastfeeding rates decline over time from birth, using the “ever breastfed” variable provides a larger number of breastfeeding women for analysis. This approach was especially important for the inclusion of African American respondents whose baseline levels of breastfeeding are relatively low.

Sociodemographic measures. Finally, we included potential confounding variables known to be associated with access to care, race, and rates of breastfeeding: (a) maternal characteristics (age, household income, level of education, marital status, father in home, and employment); (b) professional care variables (private source of health care, insurance status, and WIC for infant); and (c) infant characteristics (gestational age and birthweight). Most of the variables were based on maternal self-report, except maternal age, level of education, marital status, and infant's gestational age and birthweight, which were based on birth certificate data.

Maternal age was grouped into four categories (<20 years, 20–29 years, 30–39 years, 40–49 years). *Household income* during the 12 months prior to delivery was grouped into four categories (<\$20,000, \$20,000–\$39,000, \$40,000–\$59,000, ≥\$60,000), as was *maternal level of education* (0–11 years, 12 years, 13–15 years, ≥16 years). Employment status was defined by whether the mother went back to work or began working at any time after delivery and was coded as a yes/no response variable. *Private source of health care* was coded as a yes/no response variable. Private care was defined as prenatal care received either in a private office or from a health maintenance organization (HMO). Public care was defined as care received from a city or county health department, community health center, hospital/work/school clinic, or hospital emergency room. *Insurance status* was a yes/no response variable based on whether the mother had any health insurance or HMO coverage during the pregnancy. *WIC for the infant* was a yes/no variable based on whether the mother received WIC services for her baby or herself after delivery.

Bivariate analyses

We initially determined weighted frequencies for all variables and used chi-square analyses to examine bivariate relationships between race and the sociodemographic, professional care, and infant characteristic measures.

We next conducted bivariate chi-square analyses to determine if there were racial differences in rates of medical provider advice to breastfeed, WIC advice to breastfeed, and WIC advice to bottlefeed. Last, we conducted chi-square analyses to determine the effect of provider and WIC advice on rates of breastfeeding in each racial group.

For all bivariate and multivariate analyses, we used SUDAAN²⁹ to adjust for the complex sampling design of the NMIHS.

Multivariate analyses

We developed two sets of logistic regression models to determine, first, the independent effect of race on receipt of breastfeeding and bottlefeeding advice and, second, the independent effects of advice and race on breastfeeding rates. We included the sociodemographic variables in the models if they were significant at $p < 0.05$ in the bivariate comparisons of white and African American respondents. We also included interaction variables to determine if medical provider advice had different effects on breastfeeding for white and African American women.

RESULTS

Sociodemographics

The survey included 4,791 African American women and 3,966 white women with live births in 1988 who differed significantly on most sociodemographic variables (Table 1). The 20–29 age group accounted for more than half of both the white and African American respondents. African American women differed significantly from white women in age, income, and years of education and were less likely to be married, less likely to be living with the fathers of their infants, less likely to be employed, less likely to have received their prenatal care in a private setting, less likely to have medical insurance, and much more likely to have their infants enrolled in the WIC program. African American women had lower rates of infants born at greater than 37 weeks gestation and infants weighing >2,500 g than white women. Overall, several factors known to be associated with less adequate health care and lower rates of breastfeeding (lack of insurance, lower income, young maternal age, and less education³⁰) were more common among the African American women in this study.

Receipt of breastfeeding advice

The bivariate chi-square analyses showed that African American women were less likely than white women to report having received breastfeeding advice from their medical providers (48.1% vs. 52.5%; $p < 0.001$) and WIC counselors (55.6% vs. 64.4%; $p < 0.001$) and were more likely to report having been advised to bottlefeed by WIC counselors (65.0% vs. 55.4%; $p < 0.001$).

The results of logistic regression models controlling for sociodemographic factors indicated that racial disparities in rates of advice varied. For medical provider advice, race did not persist as a significant predictor (odds ratio [OR] = 0.95; 95% CI 0.81, 1.12). Being an African American was the only factor associated with less breastfeeding advice from WIC counse-

Table 1. Characteristics of white and African American women who delivered live births, 1988 National Maternal and Infant Health Survey

Characteristic	White (n=3,966) Percent	African American (n=4,791) Percent	p-value ^a
Maternal factors			
Age			<0.001
<20 years	9.7	22.7	
20–29 years	58.9	58.4	
30–39 years	30.3	18.0	
≥40 years	1.1	0.8	
Household income			<0.001
<\$20,000	33.2	72.5	
\$20,000–\$39,999	37.8	19.1	
\$40,000–\$59,000	18.4	6.0	
≥\$60,000	10.5	2.4	
Level of education			<0.001
0–11 years	14.3	31.6	
12 years	41.6	44.4	
13–15 years	24.7	16.9	
≥16 years	19.5	7.1	
Married	84.6	34.5	<0.001
Father in home	86.0	39.0	<0.001
Employed	59.3	53.9	<0.001
Professional care factors			
Private care	78.5	45.3	<0.001
Had medical insurance	77.6	49.6	<0.001
WIC for infant	26.0	70.8	<0.001
Infant factors			
Gestational age ≥37 weeks	93.4	81.4	<0.001
Birthweight ≥2,500 g	94.4	86.8	<0.001

^aChi-square comparison of proportions.

lors (OR = 0.73; 95% CI 0.57, 0.95). Conversely, the model of WIC bottlefeeding advice showed that African American women were much more likely to receive bottlefeeding advice from WIC (OR = 1.56; 95% CI 1.21, 2.01) (Table 2).

Effects of breastfeeding advice

African American women were much less likely than white women to report breastfeeding their infants (24.0% vs. 59.3%; $p<0.001$).

The rate of breastfeeding was higher for white women who had been advised by their medical providers to breastfeed (73.1%) than for those who had not received this advice from medical providers (44.2%; $p<0.001$). The rate of breastfeeding was also higher for white women who reported being advised by their WIC counselors to breastfeed (51.2%), compared with those who had not received this advice from WIC

Table 2. Adjusted odds ratios^a for receipt of infant feeding advice for African American women^b

Advice	OR	95% CI
Provider advice to breastfeed	0.95	0.81, 1.12
WIC counselor advice to breastfeed	0.73	0.57, 0.95
WIC counselor advice to bottlefeed	1.56	1.21, 2.01

^aAdjusted for maternal age, income, level of education, private health care, insurance status, marital status, living with infant's father, and employment status as well as infant's weight, gestational age, and participation in WIC.

^bReference group is white women.

OR = odds ratio

CI = confidence interval

counselors (25.3%; $p<0.001$) and lower for those who had been advised by WIC to bottlefeed (34.5% vs. 51.3%; $p<0.001$), compared with those who had not been advised by their WIC counselors to bottlefeed (Figure 1).

Although their overall breastfeeding rate was lower, African American women showed similarly higher rates with medical provider (34.9% vs. 15.1%; $p<0.001$) and WIC breastfeeding advice (25.7% vs. 11.1%; $p<0.001$) as well as lower rates of breastfeeding when advised by WIC to bottlefeed (17.0% vs. 23.5%; $p<0.001$) (Figure 2).

Predictors of breastfeeding

The final regression model used breastfeeding as the outcome variable and controlled for differences in breastfeeding advice, the interactions of race and advice (which measured differential effects of advice by race), as well as the confounding sociodemographic variables associated with breastfeeding. This analysis showed that being African American remained independently associated with lower rates of breastfeeding (OR = 0.41; 95% CI 0.32, 0.52) (Table 3). We also found that medical provider advice was equally effective in promoting breastfeeding for both African American and white women.

Table 3. Adjusted odds ratio^a associations of race and advice with breastfeeding

Variable	OR	95% CI
African American	0.41	0.32, 0.52
Provider advice to breastfeed	4.49	3.68, 5.47
WIC counselor advice to breastfeed	2.12	1.47, 3.06
WIC counselor advice to bottlefeed	0.38	0.27, 0.52

^aAdjusted for maternal age, income, level of education, private health care, insurance status, marital status, living with infant's father, and employment status as well as infant's weight, gestational age, and participation in WIC.

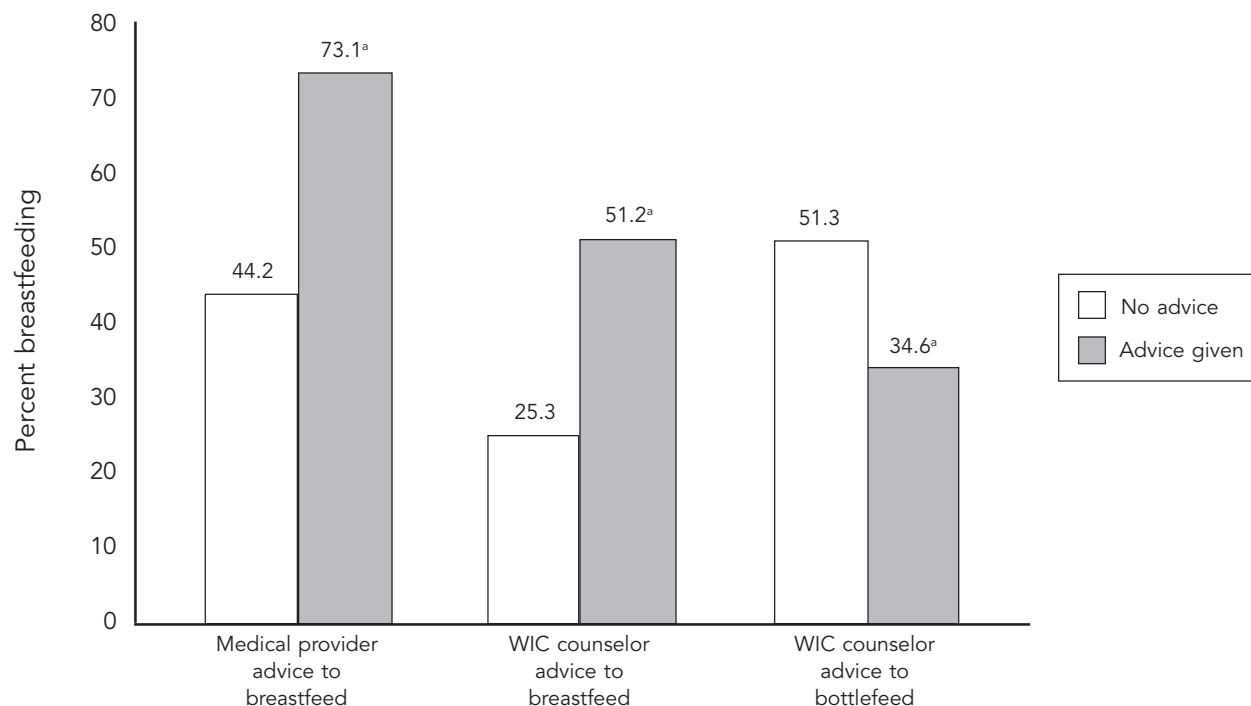
OR = odds ratio

CI = confidence interval

DISCUSSION

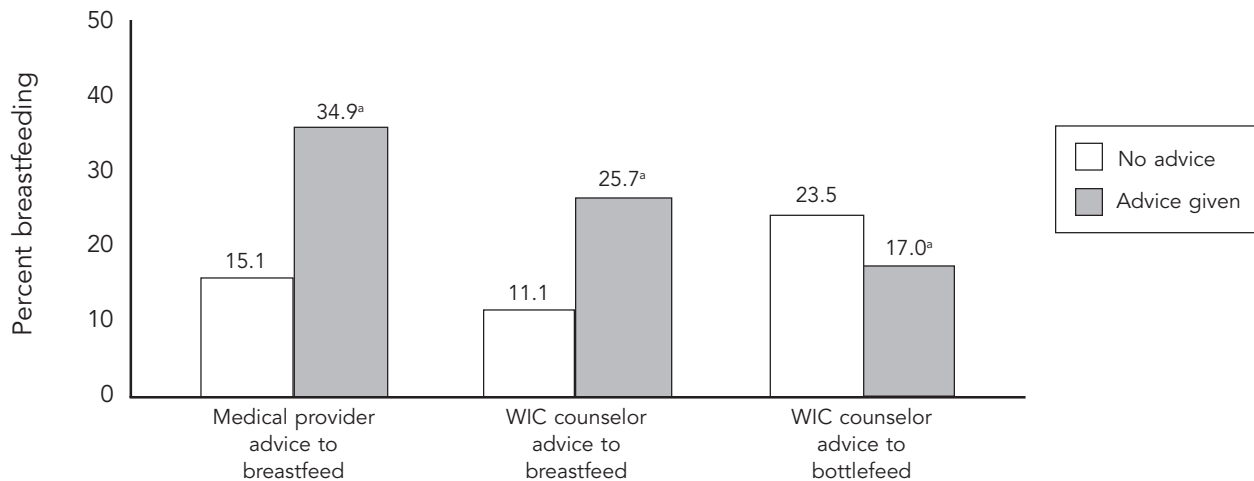
Our results reveal some disparities in receipt of breastfeeding advice between African American and white women. African American women were less likely to report having been advised by WIC counselors to breastfeed and more likely to report having been ad-

Figure 1. Breastfeeding rates and prenatal advice reported by 3,966 white women with live births in 1988



^a $p<0.001$

Figure 2. Breastfeeding rates and prenatal advice reported by 4,791 African American women with live births in 1988



^a $p < 0.001$

vised by WIC counselors to bottlefeed. However, after controlling for sociodemographic confounders, we found that African American women reported receiving the same amount of breastfeeding advice from their medical providers. These results are similar to those of Kogan et al., who also analyzed data from the NMIHS and found that African American women receive less prenatal advice regarding tobacco and alcohol use from physicians than white women but the same amount of breastfeeding advice.³¹

The lack of disparity in breastfeeding advice from physicians is promising, but the difference in WIC settings is worrisome, particularly because mothers who receive WIC services come from low-income backgrounds, which places them at greater risk for not initiating breastfeeding.³⁰ The WIC program is an important supplemental nutrition program for pregnant and nursing low-income women and their children. In addition to nutritional support, the program provides nutrition counseling and has a program to promote breastfeeding.³² The disparities in morbidity and mortality between African American and white infants,²³ combined with the known protective effects of breastfeeding, make the lower levels of WIC breastfeeding advice especially problematic. Previous studies found an association between participation in WIC and low rates of breastfeeding.³¹ This study adds to that work by finding racial differences in the rates of breastfeeding advice offered by WIC counselors. Hence, African

American women who participate in WIC are at particular risk for low rates of breastfeeding.

WIC breastfeeding promotion

Since these data were collected, WIC has begun several new initiatives to promote breastfeeding.³³ The Child Nutrition and WIC Reauthorization Act of 1989 included provisions to promote breastfeeding by requiring the development of standards for breastfeeding promotion, authorizing the use of WIC funds to purchase breast pumps, adding a breastfeeding expert to the National Advisory Council on Maternal, Infant and Fetal Nutrition, and setting minimal state spending requirements for breastfeeding promotion. Legislation passed in 1994 included requirements for collecting data on the incidence and duration of breastfeeding.³⁴ In addition, the WIC state agencies were encouraged to provide enhanced food packages to breastfeeding women and assign dedicated staff to breastfeeding promotion.³⁵

Breastfeeding promotion initiatives should be administered with an understanding of cultural beliefs to best serve the ethnically diverse population of WIC recipients.³⁶⁻⁴¹ The Food and Nutrition Service of the U.S. Department of Agriculture recognizes this, and includes organizations such as the African American Breastfeeding Alliance, the National Alliance for Hispanic Health, and the Indian Health Service in its Breastfeeding Promotion Consortium.⁴² However, the

cultural appropriateness of WIC breastfeeding initiatives depends on local WIC staff members understanding the specific needs of the women they serve as well as the desire to develop and implement culturally specific breastfeeding promotion. Recent data show that breastfeeding initiatives have been successful, with the percentage of WIC mothers breastfeeding in the hospital increasing from 34.2% in 1989 to 46.6% in 1995.⁴³ However, the 1997 WIC Infant Feeding Practices Study sponsored by the Food and Nutrition Service found that disparities in breastfeeding initiation persisted, with 34% of African American mothers initiating breastfeeding compared to 53% of white mothers.⁴⁴ This and other WIC surveys have not determined whether perceived differences in receipt of breastfeeding advice have persisted since the NMIHS data were collected in 1988.

Study limitations

A limitation of this study is that the data were subject to recall bias. The mean interval between delivery and interview for the NMIHS was 17 months for women with live births. At that point, the decision to breast or bottle feed has been made and carried out. Mothers will most likely make a choice that they feel is best for their infants, and concerns about the poor nutritional state of the mother or not having enough milk are often stated as reasons for bottlefeeding.⁴⁵⁻⁴⁷ Mothers may selectively recall being advised to feed their infants with the method that they ultimately chose, thus introducing recall bias. Providers in this study were also asked about the prenatal care they provided to these women. However, they were not asked about breastfeeding advice, which could have served as validation for the mothers' responses.

The data in the NMIHS do not include variables that address the quality or the content of the advice these women received. Several studies have shown that health professionals play a secondary role to grandmothers, husbands, and friends in supporting breastfeeding.^{27,36,48-50} We did not have data to include their influences in the analyses.

Breastfeeding is an inexpensive method of health promotion that benefits most infants.²³ Race is a significant predictor of breastfeeding, and the lower rates of professional advice we found in this study account for only part of the lower breastfeeding rate among African Americans. Additional factors likely explain the remaining difference, including cultural factors that we could not assess in this study. Health and nutrition professionals need to increase their efforts to promote breastfeeding among African American

women. Particular efforts should be made in WIC settings to develop culturally appropriate breastfeeding promotions that target African American women, and future WIC evaluations should assess clients' perceptions of receipt of advice. Further studies are needed to determine what cultural or social factors influence breastfeeding and to identify methods to increase the number of women selecting this infant feeding choice.

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REFERENCES

1. Kovar MG, Serdula MK, Marks JS, Fraser DW. Review of the epidemiologic evidence for an association between infant feeding and infant health. *Pediatrics* 1984;74(4 Pt 2):615-38.
2. Merrett TG, Burr ML, Butland BK, Merrett J, Miskelly FG, Vaughan-Williams E. Infant feeding and allergy: 12-month prospective study of 500 babies born into allergic families. *Ann Allergy* 1988;61(6 Pt 2):13-20.
3. Cunningham AS, Jelliffe DB, Jelliffe EF. Breast-feeding and health in the 1980s: a global epidemiologic review. *J Pediatrics* 1991;118:659-66.
4. Lawrence RA. Breastfeeding: a guide for the medical profession. 4th ed. St. Louis: C.V. Mosby Company; 1994.
5. Newburg DS, Peterson JA, Ruiz-Palacios GM, Matson DO, Morrow AL, Shults J, et al. Role of human-milk lactadherin in protection against symptomatic rotavirus infection. *Lancet* 1998;351(9110):1160-4.
6. Alho OP, Koivu M, Sorri M, Rantakallio P. Risk factors for recurrent acute otitis media and respiratory infection in infancy. *Int J Pediatric Otorhinolaryngology* 1990;19:151-61.
7. Daly KA, Selvi RE, Lindgren B. Knowledge and attitudes about otitis media risk: implications for prevention. *Pediatrics* 1997;100:931-6.
8. Duncan B, Ey J, Holberg C, Jr., Wright AL, Martinez FD, Taussig LM. Exclusive breast-feeding for at least 4 months protects against otitis media. *Pediatrics* 1993;91:867-72.
9. Paradise JL, Elster BA, Tan L. Evidence in infants with cleft palate that breast milk protects against otitis media. *Pediatrics* 1994;94(6 Pt 1):853-60.
10. Pickering LK, Granoff DM, Erickson JR, Masor ML, Cordle CT, Schaller JP, et al. Modulation of the immune system by human milk and infant formula containing nucleotides. *Pediatrics* 1998;101:242-9.
11. Fergusson DM, Woodward LJ. Breast feeding and later

- psychosocial adjustment. *Paediatr Perinat Epidemiol* 1999;13:144-57.
12. Lucas A, Morley R, Cole TJ, Lister G, Leeson-Payne C. Breast milk and subsequent intelligence quotient in children born preterm. *Lancet* 1992;339(8788):261-4.
 13. Rogan WJ, Gladen BC. Breast-feeding and cognitive development. *Early Human Dev* 1993;31(3):181-93.
 14. Davidson-Rada J, Caldis S, Tonkin SL. New Zealand's SIDS prevention program and reduction in infant mortality. *Health Educ Q* 1995;22(2):162-71.
 15. Ford RP, Taylor BJ, Mitchell EA, Enright SA, Stewart AW, Becroft DM, et al. Breastfeeding and the risk of sudden infant death syndrome. *Int J Epidemiology* 1993;22:885-90.
 16. L'Hoir MP, Engelberts AC, van Well GT, Bajanowski T, Helweg-Larsen K, Huber J. Sudden unexpected death in infancy: epidemiologically determined risk factors related to pathological classification. *Acta Paediatrica* 1998;87:1279-87.
 17. Department of Health and Human Services (US). *Healthy People 2010*. 2nd ed. With understanding and improving health and objectives for improving health. 2 vols. Washington: Government Printing Office; 2000 Nov.
 18. American Dietetic Association. Position of the American Dietetic Association: promotion and support of breast-feeding. *J Am Dietetic Assoc* 1993;93:467-9.
 19. American Academy of Pediatrics. The promotion of breast-feeding: policy statement based on Task Force report. *Pediatrics* 1982;69:654-61.
 20. Department of Health and Human Services (US), Office on Women's Health. *HHS Blueprint for Action on Breastfeeding*. Washington: DHHS; 2000.
 21. Kum-Nji P, Mangrem CL, Wells PJ, White P, Herrod HG. Breast-feeding initiation: predictors, attitudes, and practices among blacks and whites in rural Mississippi. *South Med J* 1999;92:1183-8.
 22. Singh GK, Yu SM. Infant mortality in the United States: trends, differentials, and projections, 1950 through 2010. *Am J Public Health* 1995;85:957-64.
 23. Forste R, Weiss J, Lippincott E. The decision to breast-feed in the United States: does race matter? *Pediatrics* 2001;108:291-6.
 24. Kistin N, Benton D, Rao S, Sullivan M. Breast-feeding rates among black urban low-income women: effect of prenatal education. *Pediatrics* 1990;86:741-6.
 25. Timbo B, Altekruze S, Headrick M, Klontz K. Breast-feeding among black mothers: evidence supporting the need for prenatal intervention. *J Soc Pediatric Nurses* 1996;1:35-40.
 26. Schwartz JB, Popkin BM, Tognetti J, Zohoori N. Does WIC participation improve breast-feeding practices? *Am J Public Health* 1995;85:729-31.
 27. Wiemann CM, DuBois JC, Berenson AB. Racial/ethnic differences in the decision to breastfeed among adolescent mothers. *Pediatrics* 1998;101(6):E11.
 28. Sanderson M, Gonzalez JF. 1988 National Maternal and Infant Health Survey: methods and response characteristics. *Vital Health Stat* 2 1998(125):1-39.
 29. Research Triangle Institute. Inc. SUDAAN. 7.5.2A ed. Research Triangle Park (NC): Research Triangle Institute; 1998.
 30. Ryan AS, Rush D, Krieger FW, Lewandowski GE. Recent declines in breast-feeding in the United States, 1984 through 1989. *Pediatrics* 1991;88:719-27.
 31. Kogan MD, Kotelchuck M, Alexander GR, Johnson WE. Racial disparities in reported prenatal care advice from health care providers. *Am J Public Health* 1994;84:82-8.
 32. Department of Agriculture (US), Food and Nutrition Service. The WIC Program mission [cited 2002 Nov 15]. Available from: URL: <http://www.fns.usda.gov/wic/>
 33. National Association of WIC Directors. Breastfeeding promotion in the WIC Program. Washington: NAWD; 1992.
 34. Department of Agriculture (US), Food and Nutrition Service. Legislative history of breastfeeding promotion requirements in WIC [cited 2002 Nov 15]. Available from: URL: <http://www.fns.usda.gov/wic/breastfeeding/bflegishistory.htm>
 35. Centers for Disease Control and Prevention (US), National Center for Chronic Disease Prevention and Health Promotion. Breastfeeding: government activities [cited 2002 Nov 15]. Available from: URL: <http://www.cdc.gov/breastfeeding/govtact-wic.htm>
 36. Bentley ME, Caulfield LE, Gross SM, Bronner Y, Jensen J, Kessler LA, et al. Sources of influence on intention to breastfeed among African-American women at entry to WIC. *J Hum Lactation* 1999;15:27-34.
 37. Black RF, Blair JP, Jones VN, DuRant RH. Infant feeding decisions among pregnant women from a WIC population in Georgia. *J Am Dietetic Assoc* 1990;90:255-9.
 38. Caulfield LE, Gross SM, Bentley ME, Bronner Y, Kessler L, Jensen J, et al. WIC-based interventions to promote breastfeeding among African-American women in Baltimore: effects on breastfeeding initiation and continuation. *J Hum Lactation* 1998;14:15-22.
 39. Long DG, Funk-Archuleta MA, Geiger CJ, Mozar AJ, Heins JN. Peer counselor program increases breastfeeding rates in Utah Native American WIC population. *J Hum Lactation* 1995;11:279-84.
 40. MacGowan RJ, MacGowan CA, Serdula MK, Lane JM, Joeseof RM, Cook FH. Breast-feeding among women attending women, infants, and children clinics in Georgia, 1987. *Pediatrics* 1991;87:361-6.
 41. Fishman C, Evans R, Jenks E. Warm bodies, cool milk: conflicts in post partum food choice for Indochinese women in California. *Soc Sci Med* 1988;26:1125-32.
 42. Department of Agriculture (US), Food and Nutrition Service. Breastfeeding Promotion Consortium (BPC) [cited 2002 Nov 15]. Available from: URL: <http://www.fns.usda.gov/wic/breastfeeding/bpc.htm>
 43. Ryan AS. Resurgence of breastfeeding in the United States. *Pediatrics* 1997;99:E12.
 44. Department of Agriculture (US), Food and Nutrition

- Service. WIC Infant Feeding Practices Study: summary of findings [cited 2002 Nov 15]. Available from: URL: <http://www.fns.usda.gov/oane/menu/published/wic/files/infant/ifps.htm>
45. Hill PD, Aldag JC. Insufficient milk supply among black and white breast-feeding mothers. *Res Nurs Health* 1993;16:203-11.
46. Obermeyer CM, Castle S. Back to nature? historical and cross-cultural perspectives on barriers to optimal breast-feeding. *Med Anthropol* 1996;17:39-63.
47. Wood SP, Sasonoff KM, Beal JA. Breast-feeding attitudes and practices of Latino women: a descriptive study. *J Am Acad Nurse Practitioners* 1998;10:253-60.
48. Bryant CA. The impact of kin, friend and neighbor networks on infant feeding practices. *Soc Sci Med* 1982;16:1757-65.
49. Baranowski T, Bee DE, Rassin DK, Richardson CJ, Brown JP, Guenther N, et al. Social support, social influence, ethnicity and the breastfeeding decision. *Soc Sci Med* 1983;17:1599-611.
50. Littman H, Medendorp SV, Goldfarb J. The decision to breastfeed: the importance of fathers' approval. *Clinical Pediatr* 1994;214-9.