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Twenty-year Trends in Breastfeeding Initiation in North Carolina: Results from the North Carolina Child Health Assessment and Monitoring Program (CHAMP) Survey

by

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Introduction

Major medical and health organizations endorse breastfeeding as the most beneficial type of nutrition to ensure the health and well-being of most infants, and recommend that mothers breastfeed exclusively for at least six months, with continued breastfeeding at least through the infant's first year.¹⁻³ Previous studies document the numerous benefits related to breastfeeding duration and exclusivity for infants' general health, growth, development, and protection against acute or chronic diseases, including otitis media, respiratory tract infections, atopic dermatitis, gastroenteritis, type 2 diabetes, sudden infant death syndrome, and obesity.⁴ Promotion and support of breastfeeding is an important public health initiative, as highlighted through the *Healthy People 2010* national health objective to increase the proportion of mothers that breastfeed in the early postpartum period to 75 percent.⁵

In 1971, breastfeeding rates reached an all-time low in the United States with only 25 percent of

mothers initiating breastfeeding.⁶ Rates of initiation dramatically increased from 1971 to 1982 (62%), but then declined from 1983 to 1989.⁷ Since 1990, the prevalence of breastfeeding initiation has been continually rising, from 52 percent in 1990 to 74 percent in 2009.⁸⁻¹⁰ Although improvements have been observed across all demographic subgroups, trends in breastfeeding have been found to vary by both maternal characteristics, such as race, ethnicity, age and parental education, as well as geographic location. The largest rate increases in breastfeeding initiation have been observed among mothers with traditionally low rates of initiation, including African Americans, mothers with a high school education or less, and mothers living in the southern states.¹¹

The purpose of this report is to examine changes over time in the prevalence of breastfeeding initiation in North Carolina. Through the Child Health Assessment and Monitoring Program (CHAMP) 2005–2009 surveys, breastfeeding history was collected on children (ages 0 to 17 years) born between 1989 and

2009. For this generation of children, parent report of breastfeeding was used to examine the 20-year trend in breastfeeding initiation.

Methods

Data

Survey data from North Carolina CHAMP 2005 through 2009 were combined to examine rates of breastfeeding initiation. NC CHAMP is an annual telephone survey that assesses health characteristics of children from age 0 to 17 years residing in North Carolina. Eligible households are recruited through the North Carolina Behavioral Risk Factor Surveillance System (BRFSS), an annual state-wide telephone survey that uses a random-digit-dial computer-assisted telephone interview to assess health characteristics of non-institutionalized adults age 18 years and older. One child is randomly selected from the household and the adult identified as most knowledgeable about the health of the selected child is called one to two weeks later to complete the CHAMP survey.¹² During recruitment through the BRFSS, the child's birth year is recorded. From 2005–2009, 76,798 adults participated in the BRFSS. A total of 23,106 (30%) reported a child under age 18 living in the household, of which 15,179 (66%) participated in CHAMP. The current study was limited to CHAMP surveys completed by the child's biological mother or father (N = 11,259).

Demographic characteristics were assessed through the 2005–2009 NC CHAMP surveys, including race, ethnicity, and parental education level. Breastfeeding initiation was assessed with the question: "Was (*child's name*) breastfed for any length of time?" Positive responses were coded as "ever breastfed" and negative responses were coded as "never breastfed." In 2005 and 2006, questions on breastfeeding were only asked of children ages 12 years and younger. In 2007 to 2009, questions on breastfeeding were asked of all ages (age 0 to 17 years).

Statistical analysis

BRFSS and CHAMP data are weighted to represent the adult and child population of North Carolina.

SAS 9.2 (Cary, North Carolina) software survey procedures were used to account for the complex survey design to calculate the point estimates and 95 percent confidence intervals. This software takes into account the complex sampling design when computing the variance, or sampling error, associated with the estimates. The 95 percent confidence interval indicates the range in which the true population value would occur 95 out of 100 times, if 100 different random samples were taken of the population. Sample size will also influence the width of the confidence interval, with small samples increasing the width of the confidence interval. The prevalence of breastfeeding initiation was calculated for each child's birth year from 1990 to 2008, with sample sizes ranging from a low of 176 in 2008 to a high of 755 in 1995. Prevalence rates for 1989 (N=93) and 2009 (N=39) are not reported due to small sample sizes for these two years of birth. For subgroup analyses, because of small sample sizes for any one year we collapsed data by birth year into two decades, ranging from 1989 to 1999 and from 2000 to 2009. Average breastfeeding initiation rates were calculated for each time period by race, ethnicity, and parental education in order to examine trend differences by demographic characteristics.

Results

Sample characteristics

The majority of respondents were the biological mother of the selected child (85.5%); 14.5 percent of respondents were the biological father. Rates of breastfeeding initiation did not differ by relationship (i.e., maternal vs. paternal report). Racial background of the child was 66.7 percent white, 20.8 percent African American and 12.5 percent other race. Ten percent of children were Hispanic. Fifty-one percent of parents had a college degree, 24.9 percent had some college education, 17.0 percent had a high school education, and 6.9 percent had less than a high school education. Fifty-two percent of children in the sample were born between 1989 and 1999, and 48 percent were born between 2000 and 2009.

Trends in breastfeeding initiation

Prevalence rates of breastfeeding initiation by child's birth year are presented in Figure 1. Based on parental report of child's breastfeeding history, breastfeeding initiation rates have been steadily increasing since 1990. Only 53.0 percent of parents with children born in 1990 report that their child was ever breastfed, compared to 66.0 percent of children born in 1998, and 76.3 percent of children born in 2008.

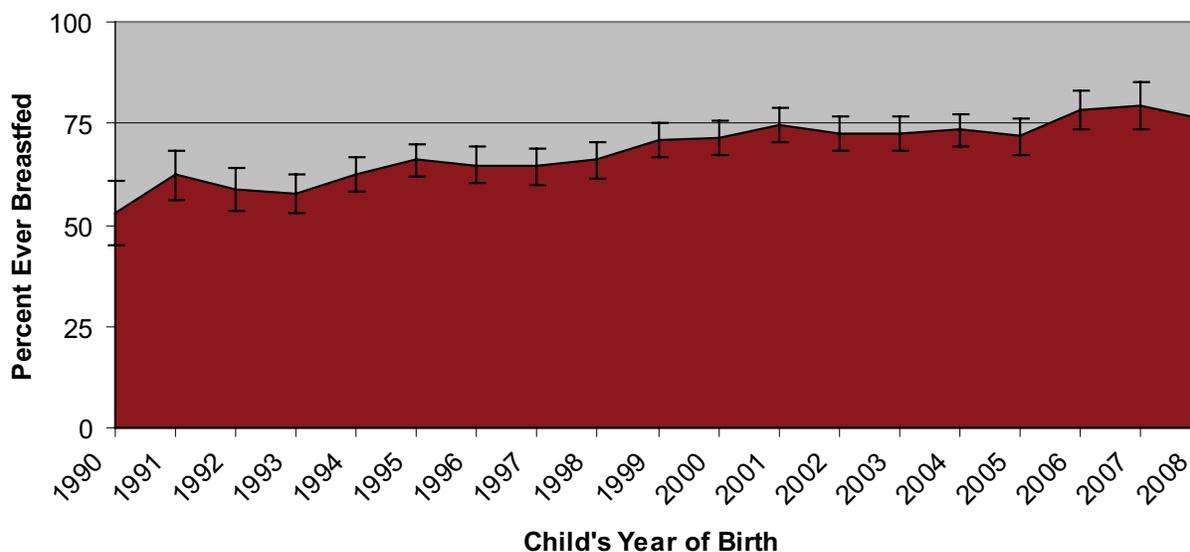
Trends in breastfeeding initiation by race, ethnicity, and parental education

The prevalence of breastfeeding initiation by child's birth decade and demographic subgroups are presented in Table 1. When comparing breastfeeding trends by race, the prevalence of breastfeeding initiation has increased the greatest among African Americans. For African Americans, the average

prevalence of breastfeeding was 41.2 percent among children born in the 1990s compared to 58.7 percent among children born after 2000. For whites, the changes in the average prevalence of breastfeeding were significant but somewhat less pronounced (69.0% for 1989–1999 vs. 76.8% for 2000–2009). The prevalence was virtually unchanged among other racial groups (74.8% for 1989–1999 vs. 79.6% for 2000–2009, respectively). Although the rate of increase was highest among African Americans, the prevalence of breastfeeding initiation remains significantly lower among African-American children born after 2000 (58.7%) compared to whites (76.8%) and other races (79.6%).

Changes over time among Hispanics are fairly small (average rate of 79.8% among children born in 1990s vs. 82.0% among children born in the 2000s). Although breastfeeding initiation has increased greatly among non-Hispanics (62.1% vs. 72.4%, respectively), the average prevalence for non-Hispanics remains

Figure 1
Percentage of Children Ever Breastfed
by Child's Year of Birth: 1990 to 2008



Source: 2005–2009 North Carolina Child Health Assessment and Monitoring Program (NC CHAMP);
Note: Bars represent 95 percent confidence intervals.

Table 1
Breastfeeding Initiation Rates for Decade of Child's Birth Year
by Demographic Characteristics

Demographic Variable	Birth Decade	N	Ever Breastfed (%)	95% CI
Race				
White	1989–1999	4,581	69.0	67.3, 70.7
	2000–2009	3,564	76.8	75.1, 78.6
African American	1989–1999	941	41.2	37.3, 45.0
	2000–2009	669	58.7	54.3, 63.2
Other	1989–1999	675	74.8	70.7, 79.0
	2000–2009	806	79.6	76.0, 83.2
Ethnicity				
Hispanic	1989–1999	515	79.8	75.3, 84.4
	2000–2009	702	82.0	78.4, 85.7
Non-Hispanic	1989–1999	5,686	62.1	60.5, 63.7
	2000–2009	4,345	72.4	70.7, 74.1
Parental Education				
Less than high school	1989–1999	350	55.1	48.4, 61.9
	2000–2009	403	73.0	67.5, 78.6
High school	1989–1999	1,166	38.6	35.0, 42.3
	2000–2009	836	55.8	51.5, 60.2
Some college	1989–1999	1,647	54.0	50.9, 57.2
	2000–2009	1,170	66.8	63.3, 70.3
College degree	1989–1999	3,038	78.2	76.3, 80.0
	2000–2009	2,628	82.8	80.8, 84.6

significantly lower than Hispanics (72.4% vs. 82.0% for children born in 2000s).

Breastfeeding initiation rates were also found to vary by level of parental education. Among college graduates, prevalence of breastfeeding initiation has only slightly increased over time (average rate of 78.2% among children born in 1990s vs. 82.8% among children born in 2000s). Breastfeeding initiation has increased to a much greater extent among parents with less than a high school education (average rate of 55.1% vs. 73.0%), as well as among high school graduates (average rate of 38.6% vs. 55.8%).

Discussion

Breastfeeding initiation rates have been steadily increasing over the past two decades.^{8–11} Based on parental report of child's breastfeeding history, just over half of children born in 1990 were ever breastfed compared to three-quarters of children born in 2008. Comparing the 1990s to the current decade, trends in breastfeeding initiation were found to differ by demographic characteristics, with the most significant increases in breastfeeding initiation observed among African Americans and among mothers with less than a high school education. Despite these increases in breastfeeding initiation, discrepancies between

certain demographic subgroups remain significant, particularly when comparing initiation rates by race. For children born after 2000, 76.8 percent of whites initiated breastfeeding, as compared to 58.7 percent of African Americans, indicating a substantial gap among African American mothers from the *Healthy People 2010* target of increasing the proportion of all mothers who breastfeed their babies to 75 percent.⁵

The prevalence of breastfeeding initiation was also found to be higher among parents with less than a high school education, compared to parents with a high school education. Similar results have been observed in national surveys¹³ as well as the North Carolina Pregnancy Risk Assessment Monitoring System (PRAMS), a survey of women who have recently given birth.¹⁴ In 2007, North Carolina PRAMS reported that 70 percent of women with less than a high school education initiated breastfeeding compared to 63 percent of high school graduates. These findings can largely be explained by the fact that Hispanic mothers tend to have high rates of breastfeeding initiation, but also low levels of education. In NC CHAMP (2005–2009), 67 percent of parents with less than a high school education were Hispanic compared to only 14 percent of parents with a high school education; however, Hispanic mothers had the highest rate of breastfeeding initiation (82.0%) of any race or ethnic group, which contributes to the differences in breastfeeding rates by parental education levels.

In North Carolina, the Women's and Children's Health Section (WCHS) in the Division of Public Health (DPH) is generally responsible for encouraging and promoting breastfeeding initiation, duration, and exclusivity in the state. The Nutrition Services Branch (NSB) coordinates the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) that identifies breastfeeding as a priority and mandates education of clients. A trained breastfeeding coordinator is available in every local WIC agency, and additional funds are also utilized for breastfeeding peer counseling programs, continuing education in lactation for health care professionals, and for the purchase of breast pumps and supplies for WIC mothers. Several branches within DPH

(including NSB, Women's Health [WH], Children and Youth, and Physical Activity and Nutrition) have worked in collaboration to build infrastructure for breastfeeding support within North Carolina's public health system. In addition, the NSB has funded regional training centers to help support lactation education for peer counselors, peer counselor managers and other healthcare providers in each respective region, based on a model found to be successful previously by the WH Branch to provide education and training for perinatal professionals. In 2006, a state plan of action was released, entitled *Promoting, Protecting and Supporting Breastfeeding: A North Carolina Blueprint for Action*,¹⁵ which outlines eight key recommendations encompassing the creation of breastfeeding friendly communities, health care systems, child care facilities, and workplaces; development of social marketing, public education, laws, policies and regulations that support and protect breastfeeding; as well as the encouragement of research and evaluation on breastfeeding outcomes, trends, quality of care, and best practices. Action on these recommendations will assist in making breastfeeding the norm in our state, leading to long-term benefits to babies and mothers in North Carolina.

Limitations

The current study results are based on state-wide cross sectional surveys of parental reports on breastfeeding history assessed when children were between 0 and 17 years of age. Although retrospective reports of breastfeeding have shown high validity and sensitivity,^{16,17} duration of breastfeeding may not be as accurately recalled by mothers with teenage children; therefore, the current study focuses on breastfeeding initiation and does not include breastfeeding at six months. Exclusivity of breastfeeding was not assessed every survey year and consequently is not reported in the current study. One of the limitations of the study is that CHAMP is a landline telephone survey; thus exclusion of households without telephone service or cell phone only households may lead to certain demographic subpopulations being under-represented. However, demographic weighting adjustments have

been found to greatly reduce possible biases to within the margin of sampling error (less than 2 percentage points) for the majority of health indicators.¹⁸

Conclusion

A substantial increase in breastfeeding has been observed since 1990 when only about half of all mothers initiated breastfeeding.⁸ Currently, the U.S. national average for breastfeeding initiation is at 73.9 percent, with the highest rate of children ever breastfed found in the state of Utah (92.8%), and North Carolina ranking 37th (66.9%).¹⁰ While increases in breastfeeding have been encouraging, discrepancies based on demographic characteristics still exist. Strategies and programs that support breastfeeding, such as those outlined in *The CDC Guide to Breastfeeding Interventions*¹⁹ and North Carolina's state plan¹⁵ are necessary to continue the positive trends seen over the last 20 years.

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