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A Report on Selected Findings from the 1994 North Carolina Birth Cohort Survey

by

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ABSTRACT

In this report, selected findings from the 1994 North Carolina Birth Cohort (NCBC) Survey are presented. The NCBC Survey was conducted by the State Center for Health Statistics in cooperation with other state agencies. The study population for the survey consisted of the June 1994 North Carolina resident birth population. Telephone interviews were conducted between two and four months after delivery with a randomly selected group of mothers with newborns. The survey collected information on the following topics:

- (1) infant sleeping position;
- (2) infant exposure to environmental tobacco smoke;
- (3) breastfeeding;
- (4) domestic violence during pregnancy;
- (5) pregnancy intendedness;
- (6) WIC and Medicaid participation, and
- (7) childhood immunization.

The results from the NCBC Survey were analyzed by maternal demographic characteristics. Several differences were found with respect to race. White women were somewhat more likely than black women to place their babies in the recommended sleeping position (side or back) to help prevent the occurrence of sudden infant death syndrome (SIDS). Whites were also more likely to breastfeed their babies than blacks, and were more likely to intend to become pregnant than blacks. Black women were less likely to report that they smoked at the time of the interview.

The results presented in this report will provide some baseline information for the new Pregnancy Risk Assessment Monitoring System (PRAMS) in North Carolina, which is an ongoing mail and telephone survey of women who have recently given birth.



Introduction

The 1994 North Carolina Birth Cohort¹ (NCBC) Survey was carried out in the fall of 1994 by the Survey Operations Unit of the State Center for Health Statistics (SCHS). Support for the Survey was a cross-program effort, involving the following state programs: WIC, Women's Health, Injury Prevention, Adult Health, and Immunization. Each of these programs contributed to the funding of the survey. This was the first survey of its kind undertaken by the State Center; that is, a large-scale telephone survey of a randomly-selected group of North Carolina mothers with newborn babies.

Topics for the survey were supplied by the participatory programs, as follows:

- sleeping position (the Survey Operations Unit and the SIDS Program);
- breastfeeding (the WIC Program);
- WIC and Medicaid participation (WIC);
- domestic violence during pregnancy (Injury Prevention);
- infant exposure to environmental tobacco smoke (Adult Health and Women's Health);
- intendedness of pregnancy (SCHS); and
- childhood immunization (Immunization).

The purpose of the 1994 Birth Cohort Survey was to obtain information that was not otherwise available on the health of mothers and infants for program planning and evaluation by the participating programs. There was also a strong research and policy incentive to study infant sleeping position, as generated by the 1994 national and state "Back to Sleep" Campaigns to prevent the occurrence of sudden infant death syndrome (SIDS). With the Birth Cohort Study, it was possible for North Carolina to develop baseline measures for infant sleeping position prior to the onset of the State Campaign.

We present here a summary of the research methods and selected findings from the 1994 Birth Cohort Survey. This report also provides an introduction to the North Carolina Pregnancy Risk Assessment Monitoring System (PRAMS), the next major birth population

¹ In survey research of human populations, a "cohort" generally refers to a group of people available for the study who share some common event (e.g., giving birth) over a specified period of time (e.g., all June 1994 births).

survey to be conducted by the SCHS. PRAMS will continue to collect some of the same information captured in the NCBC Survey, and will address an important design limitation revealed in the administration of the NCBC Survey.

Methods

NCBC Survey Sample & Design

The survey target population (i.e., the population of interest for the study) consisted of June 1994 births that occurred in-state to North Carolina residents. The target population was divided into four separate groups according to race (white or black) and birth order (first birth or higher); within each of the four groups, a random sample of birth certificates was selected.

Only births to black mothers and white mothers were included in the sample frame (i.e., the list of those eligible for the survey) because of the small number of births to women of other race or ethnic groups. Birth certificates that indicated an infant death or an adoption were excluded from the survey. Also, because the sample was drawn approximately two months after June births had occurred, any June birth processed by the Vital Records Section of the SCHS later than August was necessarily omitted from the study.

There were 7,839 births in the June 1994 birth population. Of these, 2,343 (30%) were omitted from the survey because these birth certificates were processed and keyed after the sample was drawn. Among the remaining 5,496 births eligible for the survey, 2,494 births were randomly selected. Thus, the initial sample size consisted of about 45 percent of eligible births.

Phone numbers for the mothers were obtained from CD ROM telephone directories, paper listings, and directory assistance. Sampled birth certificates were also linked with the State Center's Health Services Information System (HSIS) files. HSIS was used as an additional source of contact information for any member of the study who may have used local health department services during pregnancy. Correct telephone numbers were found for 1,191 births, slightly less than half of the sampled births. The total number of interviews obtained was 1,143. Of those contacted, only a very small percent (3%) declined to participate in the survey.

The Birth Cohort Survey questionnaire was developed by the Survey Operations Unit of the SCHS. Questions were adapted from existing national surveys and were also provided by participating programs. Careful attention was given to assure that program-specific questions accurately reflected the program's information needs.

Analysis

The results for the survey were adjusted (or weighted) to take into account the facts that: (1) not all survey respondents had the same chance of being selected; (2) the percentage of births omitted from the survey because of late registration was not consistent across hospitals; and (3) differences in maternal demographic characteristics existed between those who were interviewed and those not interviewed (who could not be reached by phone). Additionally, the adjustment process brought into balance the demographic distribution of survey participants with that of the target population.

To account for the design of the survey, (the fact that the survey used complex random sampling methods), the SUDAAN² software for survey analysis was used to calculate point estimates (percentages) and the associated 95% confidence intervals (95%CI). The 95%CI provides upper and lower limits for determining with 95 percent certainty the range containing the true³ value for the population (which the sample estimates represent).

For all results presented in this report, only point estimates are provided. In general, the point estimates obtained from the NCBC Survey were within +/- 3 to 4 percentage points of the population values, as defined by the 95%CI.

Results

In the following, the survey results are tabulated by various demographic characteristics of the mother (demographic information derived from the birth certificate). Rules about smoking in the home are also presented due

² SUDAAN (SURvey DATA ANalysis) was developed by the Research Triangle Institute, located at 3040 Cornwallis Rd, Research Triangle Park, NC, 27709.

³ The "true" population value would be obtained if *everyone* in the population of interest were sampled or interviewed.

to the relevance to infant exposure to ETS (Environmental Tobacco Smoke).

Infant Sleeping Position

Table 1 shows the percentage of infants placed to sleep in a recommended position at the time of the interview.

Characteristic	Percentage placed in recommended position (side or back)
<i>Race:</i>	
White	58%
Black	50%
<i>Maternal education:</i>	
Less than HS	56%
High school/GED	57%
Greater than HS	56%
<i>Marital Status:</i>	
Married	58%
Not Married	51%
TOTAL	56%

White mothers were somewhat more likely than black mothers to place their infants to sleep on his/her back or side (Table 1). Married women were also somewhat more likely than unmarried women to use the recommended positions. However, there was no significant difference in infant sleeping position when analyzed by levels of education.

The top three reasons reported among mothers who placed their infant in the recommended position were: (1) the Doctor/nurse suggested it (57%), (2) to prevent SIDS (34%), and (3) the baby likes the position (32%). By contrast, the top three reasons for mothers *not* placing their infant in the recommended position were: (1) the baby likes the position (68%), (2) to prevent choking (20%), and (3) family/friends suggested it (16%). (Percentages sum to more than 100 because respondents

could list multiple reasons for using a particular sleeping position.)

Infant Exposure to Environmental Tobacco Smoke (ETS)

The NCBC Survey asked several questions on infant ETS exposure. Information was obtained on:

- smoking habits while feeding, holding, or changing the baby;
- rules about smoking in the home; and
- rules about smoking when the baby was in the room.

<i>No smoking allowed while baby in room:</i>	Current Non-smoker	Current Smoker
Characteristic		
<i>Race:</i>		
White	97%	74%
Black	98%	87%
TOTAL	97%	77%

The results from Table 2 show that the large majority of all mothers reported that they do not allow smoking while the baby is in the room. However, among current smokers, black mothers were significantly more likely than white mothers to report that they did not allow smoking while the baby was in *the room*.

By contrast, a significantly higher proportion of white mothers (73%), as compared to black mothers (62%), reported that they did not allow any smoking in *the home*.

At the time of the interview (between two to four months postpartum), 25 percent of white mothers and 20 percent of black mothers reported that they were current smokers.

Breastfeeding

The survey results showed that, overall, 50 percent of mothers reported that they attempted to breastfeed for at least one day; among these mothers, 58 percent had stopped breastfeeding by the time of the interview (two to four months postpartum). Approximately 50 percent of these mothers had stopped breastfeeding by the time the infant was seven weeks old.

Characteristic	<u>% Who Breastfed</u>
<i>Race:</i>	
White	57%
Black	31%
<i>Maternal education:</i>	
Less than HS	21%
High school/GED	42%
Greater than HS	71%
TOTAL	50%

Table 3 shows that better educated women were much more likely to have breastfed than women with less education. In the June 1994 birth cohort, white mothers were far more likely than black mothers to breastfeed their babies.

The primary reason that mothers gave for breastfeeding (or trying to breastfeed) was their babies health (83%). Other frequently reported reasons included maternal bonding with the baby (12%), maximum nutrition for the baby (8%), building their babies immune systems (6%), and having breastfed a previous child (6%). Furthermore, among mothers who needed help with breastfeeding, the largest percentage reported seeking help from a breastfeeding counselor or consultant (22%) or from a nurse at a hospital or birthing center (20%). Other sources of help included friends, relatives, health department nurses, and books or magazines. About 17 percent reported that they did not ask for help with breastfeeding.

The primary reason cited by mothers who *did not* attempt to breastfeed their babies was simply not wanting to or feeling uncomfortable or embarrassed about breastfeeding (40%). Returning to work, school, or military duty was also a commonly reported reason for not breastfeeding (21%).

Violence During Pregnancy

Overall, fewer than three percent of mothers reported being victims of domestic violence by their husband, boyfriend, or partner during their last pregnancy. This figure, however, is notably lower than other sources have reported. For instance, recent results from the South Carolina PRAMS Survey found that 11 percent of women experienced physical violence during pregnancy⁴.

With respect to the demographic groups most at risk for violence during pregnancy, the results from the NCBC Survey were consistent with other studies. For the June 1994 cohort, the highest prevalence of maternal domestic violence occurred among younger women, poor women, single women, those with less than a high school degree, and women on Medicaid (results not shown).

Pregnancy Intendedness

Fifty-seven percent of mothers reported that their pregnancy was intended (i.e., they became pregnant when they wanted to or later than they wanted to); 29 percent reported that their pregnancy was mistimed (i.e., they became pregnant earlier than they wanted to); and 14 percent reported that their pregnancy was not wanted, that is, they did not want to become pregnant at that time or at any time in the future.

When analyzing pregnancy intendedness by race, white mothers (68%) were significantly more likely than black mothers (31%) to report that their pregnancy was intended. Similarly, a significantly smaller proportion of white mothers (9%), as compared to black mothers (26%), reported that they did not want to become pregnant at that time or at any time in the future.

⁴ Cokkinides V, Coker AL, Sappenfield W. Physical violence during pregnancy. Special Deliveries from SC PRAMS, No. 2. South Carolina Department of Health and Environmental Control. Spring 1997.

Use of Services

WIC

Fifty-four percent of women reported receiving WIC during their pregnancy. Fifty-five percent of mothers reported receiving WIC at the time of the interview. Only 5 percent of mothers who received WIC during their pregnancy were not receiving it at the time of the interview.

Medicaid

Forty-nine percent of mothers had their delivery costs paid by Medicaid.

Discussion

In the following we describe those items of information that are common to both the NCBC and the PRAMS Survey. By revisiting these survey questions in PRAMS (approximately 4 years after the NCBC), it will be possible to update the corresponding NCBC estimates and determine the extent to which they may have changed over time. (For a short description of NC PRAMS see Appendix A.)

In addition, we briefly discuss an important limitation of the NCBC Survey that will be ameliorated with the design and resources available for the PRAMS Survey.

NCBC Baseline Indicators for PRAMS

The NCBC Survey will help provide baseline information for PRAMS with respect to the following indicators: (1) infant sleeping position, (2) breastfeeding, (3) postpartum smoking, and (4) pregnancy intendedness.

Though the NCBC contained an extensive number of questions on infant sleeping position, both surveys ask the respondent to describe the usual position in which the infant is placed to sleep.

There are two questionnaire items associated with breastfeeding on the NCBC Survey that are also available in PRAMS: (1) whether the mother breastfeed at all, and (2) whether she was still breastfeeding at the time of the interview (which for both surveys, occurs approximately 2-4 months after delivery).

The following information from the NCBC Survey on maternal smoking will provide baseline data for PRAMS: (1) mothers who are current smokers at the time of the interview, and (2) rules about smoking when the baby is in the room.

With regard to pregnancy intendedness, both surveys measure the extent to which the mother intended to become pregnant then, sooner, or later, or did not want to become pregnant then or at any time in the future.

NCBC Survey Limitation & Advantages of PRAMS

During the administration of the NCBC Survey it was believed that the number of completed interviews for the study might have been increased with the addition of a mail-survey component. For members of the survey sample that could not be located by phone, many could have been contacted by mail using birth certificate or other sources of address information. Had the NCBC Survey project had sufficient resources and time to administer a mail and telephone survey, the overall response rate for the study would have improved.

By contrast, PRAMS is designed as a *mail and telephone* survey. Mothers with newborn infants will be randomly selected to participate in the survey (as was done with the NCBC study). Phone interviews will be attempted for any mother who does not respond to at least two mailings of the survey. The State Center will carry out the mailed portion of the PRAMS Survey, and is contracting with another agency to administer the phone portion of the survey. The funding for this effort has been provided through a cooperative agreement with the Centers for Disease Control and Prevention (CDC).

Given this level of support for the PRAMS Project, we anticipate that the overall response rate for the PRAMS survey will be higher than that observed for the NCBC study. Also, by having the mail component, women without telephones, who are often in high risk groups, can also be reached. The experience and lessons gained from the NCBC Survey will help contribute to the success of the PRAMS Project.

Acknowledgments

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Appendix A

The Pregnancy Risk Assessment Monitoring System (PRAMS) Project

In August of 1996, the State Center received a grant from the Centers for Disease Control and Prevention (CDC) to carry out an ongoing population-based survey of North Carolina mothers with newborns.

There are currently 17 states participating in the PRAMS Project, which represent about 35% of annual births that occur in the US. The PRAMS Survey contains a set of core, CDC-designed questions that must be asked by participating states; states also have the opportunity to introduce 15-20 questions of their own that are specific to state needs.

The sample for PRAMS will be drawn from three categories of birth weight, as recorded on the birth certificate: (1) normal birth weight, greater than or equal to 2500 grams, (2) moderately low birth weight, 1500 to 2499 grams, and (3) very low birth weight, less than 1500 grams. Within each of these birth weight categories, a random sample of birth certificates will be selected.

The target population for the PRAMS survey is the annual North Carolina resident birth population. The first round of data collection is scheduled to begin in October of 1997 and will continue on a monthly basis for at least five years.



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