



SC PRAMS Special Delivery

Infant Bed Sharing in South Carolina, 2004-2006

Introduction

The 2005 South Carolina Infant Mortality Report indicated a slight increase in the South Carolina infant mortality rate from 2004 to 2005¹. In 2004, 9.3 infant deaths occurred for every 1,000 live births. In 2005, 9.5 infant deaths occurred for every 1,000 live births.

This increase is due, in part, to a 65.5 percent increase in infant deaths from Sudden Infant Death Syndrome (SIDS) and unsafe sleep environments from 2004 to 2005. In 2004, 29 SIDS cases were reported, whereas 48 cases were reported in 2005.

In its 2005 Policy Statement, the American Academy of Pediatrics (AAP) Task Force on SIDS recommends that infants not bed share during sleep to reduce the risk of SIDS². Bed sharing is a form of co-sleeping in which an infant sleeps in a bed with another person, often the infant's mother. The recommendation by the AAP that infants not bed share has been the subject of substantial controversy. Some epidemiological studies have shown that infants that bed share are at an increased risk for SIDS or accidental

death,^{3,4} while others have shown an increased risk in SIDS among only infants that bed share with a smoker^{5,6}. Other researchers point to the potential benefits of bed sharing and argue bed sharing, when done properly, does not result in an increased SIDS risk^{7,8}.

What is SC PRAMS?

The South Carolina Pregnancy Risk Assessment Monitoring System (S.C. PRAMS) is an ongoing population-based surveillance system of maternal behaviors and experiences before, during and after pregnancy. About 2,300 mothers are randomly sampled from the state's live birth registry each year.

The data presented in this newsletter reflect live births to South Carolina mothers occurring in South Carolina during the years of 2004, 2005, and 2006. The overall response rate for these three years was 70.0 percent.

The Bureau of Maternal and Child Health at the South Carolina Department of Health and Environmental Control (S.C. DHEC) echoes the AAP recommendation that infants not bed share. This report seeks to identify characteristics associated with mothers reporting infant bed sharing in South Carolina in the years 2004-2006.

Methods

Women that are South Carolina residents delivering live born infants in South Carolina are eligible to be selected

for participation in the PRAMS project. All PRAMS participants are selected through a random sampling of the South Carolina live birth registry, stratified by birth weight.

For the years 2004-2006, 6,972 women were sent a South Carolina PRAMS survey. Of these women, 4,766 completed the survey, yielding an unweighted response rate of 68.4 percent (weighted response rate: 70.0 percent).

Only non-Hispanic white women, non-Hispanic black women, and women that are living with their infants at the time of the survey are included in the analyses described in this report (n=3,672). Further, observations with missing information on infant bed sharing (n=22) or any of the selected maternal characteristics (n=532) are excluded from these analyses. This results in a total sample of 3,118 women included in these analyses.

SAS-callable SUDAAN 10.0 is used to calculate frequencies and percentages and to conduct all statistical tests and analyses presented in this report. SUDAAN is used to accommodate the complex sampling design employed by the SC PRAMS project and to weight survey responses so that the data are representative of all live births occurring in South Carolina. The survey responses are weighted to account for sampling design, nonresponse, and noncoverage.

The S.C. PRAMS Phase V questionnaire asks new mothers the following question: “How often does your new baby sleep in the same bed with you or anyone else?” The answer choices for this question include: always, often, sometimes, rarely, and never.

A three-category bed sharing variable (frequent/infrequent/never) is created to be used in the analyses described in this report. Mothers reporting that their infants always or often bed share are categorized as frequently bed sharing, mothers reporting that their infants sometimes or rarely bed share are categorized as infrequently bed sharing, and mothers reporting that their infants never bed share are categorized as never bed sharing.

Chi-square tests of independence are used to assess the significance of the bivariate relationship between bed sharing and several characteristics of interest. Then, polytomous multivariate logistic regression is used to model the relationship between the three-category infant bed sharing frequency variable and selected characteristics. The final logistic model is selected using backwards stepwise elimination, eliminating variables with a p-value greater than 0.20. Interactions between race and other independent variables are also tested.

For each characteristic selected for the logistic model two adjusted odds ratios (AOR's) are presented. One AOR gives the odds of bed sharing infrequently compared to never bed sharing. The other AOR gives the odds of bed sharing frequently compared to never bed sharing.

Results

There were 3,118 women included in this study, representing approximately 120,614 South Carolina women who delivered a full-term, live-born infant during 2004, 2005 and 2006 (after statistical weighting).

Overall, 24.0 percent of infants bed shared frequently, 43.5 percent of infants bed shared infrequently and 32.5 percent never bed shared.

Figure 1 displays the prevalence of frequent, infrequent, and never bed sharing by year in South Carolina. The prevalence of frequent and infrequent bed sharing decreased from 2004 to 2005 and increased from 2005 to 2006. This resulted in a small net increase in the prevalence of infrequent bed sharing; however, there is no statistically significant association between year of birth and bed sharing frequency at a 0.05 alpha level.

Figure 1: Bed sharing prevalence by year of birth, South Carolina PRAMS 2004-2006

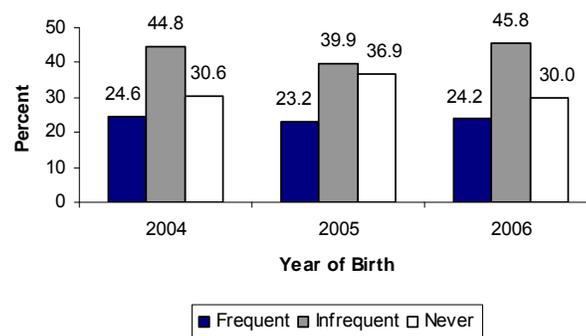


Table 1 gives the unweighted number and weighted percent of infants frequently, infrequently, and never bed sharing by selected characteristics of interest. A chi-square test of independence was done to analyze the significance of the bivariate association between each maternal characteristic and bed sharing frequency.

Table 1: Bed sharing frequency by selected maternal and infant characteristics.

Characteristic	Frequent Bed Sharing (N=745)		Infrequent Bed Sharing (N=1334)		Never Bed Sharing (N=1039)		P-value*
	Unweighted n	Weighted Percent	Unweighted n	Weighted Percent	Unweighted n	Weighted Percent	
Race							
Non-Hispanic Black	489	41.4	580	43.9	266	14.7	<0.0001
Non-Hispanic White	256	15.1	754	43.3	773	41.6	
Mother's Age (years)							
<20	131	34.5	165	41.9	82	23.6	0.0002
20-29	448	25.1	736	44.3	562	30.6	
≥30	166	18.2	433	42.5	395	39.3	
Marital Status							
Married	272	16.8	722	43.6	681	39.6	<0.0001
Unmarried	473	33.9	612	43.4	358	22.7	
Poverty Status							
<100% of poverty level	303	33.0	392	42.6	279	24.4	<0.0001
100-185% of poverty level	246	29.7	391	42.6	217	27.7	
≥185% of poverty level	196	15.1	581	44.5	543	40.4	
Education							
Less than HS	184	32.7	216	39.5	158	27.8	0.0020
Completed HS	216	27.1	353	43.8	246	29.1	
More than HS	345	20.0	765	44.6	635	35.4	
Gender of Baby							
Male	355	22.8	681	45.0	499	32.2	0.4305
Female	390	25.4	653	41.8	540	32.8	
Birth weight of Baby (grams)							
Low birth weight (<2500)	489	28.5	833	39.6	653	31.9	0.0169
Normal birth weight (≥2500)	256	23.6	501	43.8	386	32.6	
Delivery Method							
C-Section	310	19.7	616	42.9	507	37.4	0.0107
Vaginal	435	25.9	718	43.7	532	30.4	
Smoked During Pregnancy							
Yes	104	21.7	199	42.9	173	35.4	0.5826
No	641	24.4	1135	43.6	866	32.0	
Prenatal Care Initiation							
Care in first trimester	563	22.0	1096	43.2	898	34.8	0.0002
Care later than first trimester	182	32.6	238	44.7	141	22.7	
Ever Breastfed							
Yes	481	23.7	933	44.8	718	31.5	0.4434
No	264	24.6	401	41.2	321	34.2	
Number of Previous Live Births							
0	375	23.8	628	45.6	443	30.6	0.1211
1-2	299	22.7	605	42.2	524	35.1	
≥3	71	33.9	101	40.3	72	25.8	
Pregnancy Intendedness[†]							
Intended	307	19.3	672	40.4	625	38.3	<0.0001
Unintended	438	29.1	662	44.6	414	26.3	
Infant Sleep Position							
Back	369	20.0	781	44.6	686	35.4	0.0003
Other	376	29.7	553	41.8	353	28.5	
Infant Age at Survey							
≤3 months	54	29.8	81	40.3	69	29.9	0.0598
Between 3 and 6 months	599	22.9	1126	45.0	834	32.1	
≥6 months	92	28.8	127	32.8	136	38.4	

*P-value from the Chi-Square test of independence

[†]Unintended pregnancies include pregnancies that were not wanted or wanted later; intended pregnancies include pregnancies that were wanted then or sooner.

Table 2: Adjusted odds ratios observed in a polytomous multivariate logistic regression analysis modeling bed sharing frequency.

Characteristic	Frequent vs Never Bed Sharing AOR* (95% CI**)	Infrequent vs Never Bed Sharing AOR* (95% CI**)
Race		
Non-Hispanic Black	6.27 (4.25, 9.27)	2.81 (1.95, 9.27)
Non-Hispanic White	Ref.	Ref.
Marital Status		
Married	Ref.	Ref.
Unmarried	1.60 (1.08, 2.37)	1.32 (0.94, 1.86)
Poverty Status		
<100% of poverty level	1.76 (1.13, 2.75)	1.17 (0.81, 1.68)
100-185% of poverty level	1.68 (1.08, 2.59)	1.11 (0.79, 1.57)
≥185% of poverty level	Ref.	Ref.
Birth weight of Baby (grams)		
Low birth weight (<2500)	0.88 (0.68, 1.13)	0.79 (0.64, 0.97)
Normal birth weight (≥2500)	Ref.	Ref.
Delivery Method		
C-Section	0.62 (0.44, 0.87)	0.80 (0.61, 1.05)
Vaginal	Ref.	Ref.
Ever Breastfed		
No	Ref.	Ref.
Yes	2.02 (1.42, 2.87)	1.60 (1.19, 2.15)
Infant Age at Survey		
≤3 months	1.92 (0.91, 4.06)	1.85 (0.98, 3.50)
Between 3 and 6 months	1.16 (0.70, 1.94)	1.77 (1.14, 2.76)
≥6 months	Ref.	Ref.

*Adjusted Odds Ratio

**95% Confidence Interval

Statistically significant associations were observed between bed sharing frequency and the following characteristics: maternal race, maternal age, marital status, poverty status, education, baby's birth weight, delivery method, prenatal care initiation, pregnancy intendedness, and infant sleep position.

To further investigate the associations between selected characteristics and bed sharing frequency, each characteristic listed in Table 1 was entered as a candidate independent variable in a polytomous logistic regression model. Several interaction terms were also tested, but found to be non-significant at the 0.05 level. The independent variables included in the final model are listed in Table 2 along with adjusted odds ratios and 95 percent confidence intervals for infrequent bed sharing (compared to never bed sharing) and

frequent bed sharing (compared to never bed sharing).

The odds of bed sharing infrequently, compared to never bed sharing, are significantly higher among non-Hispanic black mothers (AOR: 2.81; 95% CI: 1.95 – 9.27) compared to non-Hispanic white mothers, mothers that initiated breastfeeding (AOR: 1.60; 95% CI: 1.19 - 2.15) compared to mothers that never breastfed, and mothers whose infants were between three and six months old (AOR: 1.77; 95% CI: 1.14 - 2.76) compared to mothers whose infants were six months old or older.

The odds of bed sharing infrequently, compared to never bed sharing, are significantly lower among mothers whose infants were born at a low birth weight (AOR: 0.79; 95% CI: 0.64 -

0.97) compared to mothers whose infants were born at normal birth weight ($\geq 2,500$ grams).

The odds of bed sharing frequently, compared to never bed sharing, are significantly higher among: non-Hispanic black mothers (AOR: 6.27; 95% CI: 4.25 - 9.27) compared to non-Hispanic white mothers; mothers unmarried at the time of birth (AOR: 1.60; 95% CI: 1.08 - 2.37) compared to mothers that were married at the time of birth; women at $<100\%$ of the federal poverty level (AOR: 1.76; 95% CI: 1.13 - 2.75) compared to women $\geq 185\%$ of the federal poverty level; women between 100% and 185% of the federal poverty level (AOR: 1.68; 95% CI: 1.08 - 2.59) compared to women $\geq 185\%$ of the federal poverty level; and mothers that initiated breastfeeding (AOR: 2.02; 95% CI: 1.42 - 2.87) compared to mothers that never breastfed.

The odds of bed sharing frequently, compared to never bed sharing, are significantly lower among mothers that had a Cesarean delivery (AOR: 0.62; 95% CI: 0.44 - 0.87) compared to mothers that had a vaginal delivery.

Discussion and Conclusion

Overall, during the years from 2004 to 2006 only 32.5% of women reported that their infant never slept in the same bed with them or anyone else, as recommended by the AAP and SC DHEC Bureau of Maternal and Child Health. There is no evidence that bed sharing practices are changing across years.

For this report, women that indicated their infant did bed share were separated into two categories: frequent bed sharers and infrequent bed sharers. The characteristics of those indicating their infants frequently bed shared and those indicating their infants infrequently bed shared were compared to women indicating their infant never bed shared.

The characteristics that were significantly associated with increased odds of infrequent bed

sharing, after adjustment, were maternal race, breastfeeding status, and infant's age at the time of the survey. The characteristics that were significantly associated with increased odds of frequent bed sharing, after adjustment, were maternal race, marital status, poverty status, and breastfeeding status.

In addition, low birth weight was associated with a significant decrease in the odds of bed sharing infrequently, and Cesarean delivery was associated with a significant decrease in the odds of bed sharing frequently.

These results suggest that the characteristics of frequent bed sharers may be different than those of infrequent bed sharers. Thus, it may be inappropriate to consider all bed sharers together as one, homogeneous group.

Despite the observed differences in the two groups, the characteristic associated with the largest increase in the odds of both infrequent and frequent bed sharing was maternal race. Therefore, any education program with the goal of increasing adherence to the recommendation that infants not bed share may be most effective if targeted to non-Hispanic black mothers.

Limitations

This report has several limitations. These results are only generalizable to non-Hispanic white and non-Hispanic black South Carolina resident mothers that gave birth in South Carolina, as these were the only women included in these analyses. Also, S.C. PRAMS data can not be used to determine or analyze the reasons for which infants are bed sharing frequently or infrequently, but can only describe the characteristics of such mothers and infants. Another limitation to this study is all answers to PRAMS surveys are self reported by the mother from two to eight months after giving birth, which may introduce various types of bias.

Safe Sleeping Tips

- **Back to sleep for infants:** Always place your baby on his/her back to sleep for naps and at night.
- **Use a firm sleep surface:** Use a safety approved crib mattress covered by a fitted sheet.
- **Keep soft objects, toys and loose bedding out of baby's sleep area:** No blankets or bumper pads.
- **Do NOT allow smoking around your baby:** Do not smoke during your pregnancy and never allow smoking around your baby.
- **Think about using a clean, dry pacifier when placing baby down to sleep:** Introduce pacifier at sleep after one month of age and/or after breastfeeding has been established.
- **Avoid overheating your baby:** Keep room at a comfortable temperature.
- **Share your room with your baby, not your bed:** Babies should not sleep in a bed, on a couch, on a chair, or with other children. Your baby may get caught under the pillows or blankets and not be able to breathe. Also, your baby may be trapped in the space between the mattress and wall, headboard, footboard, or bed railings.



South Carolina Department of Health
and Environmental Control

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