



Racial Disparities in Infant Sleep Position in Rhode Island

HYUN (HANNA) KIM, PhD; RACHEL CAIN, BA; SAMARA VINER-BROWN, MS; KRISTINE CAMPAGNA, MEd; CRYSTAL ROACH

Positioning an infant to sleep on the back (supine positioning) has been recommended by the American Academy of Pediatrics (AAP) since 1992 to reduce the risk of Sudden Infant Death Syndrome (SIDS).¹ SIDS is defined as a sudden death before 1 year of age that cannot be explained despite a thorough case investigation, including a complete autopsy, death scene examination, and review of the clinical history.^{2,3} SIDS is the leading cause of post-neonatal (1-12 months of age) mortality, and the third leading cause of infant (under 1 year old) mortality in the United States.^{3,4} In 2010, 2,063 deaths were reported as SIDS.³ The rates of SIDS are disproportionately higher for non-Hispanic black and American Indian/Alaska Native infants than the rest of the population.^{3,4}

Infants who are placed to sleep on their stomachs or sides (non-supine positioning) are at higher risk for SIDS than infants who are placed on their backs to sleep (supine positioning).⁴ Therefore, to reduce the risk of SIDS, infants should be placed to sleep in a supine position for every sleep by every caregiver until 1 year of life.⁵ The Healthy People 2020 target is to increase the proportion of infants who are put to sleep on their backs to 75.9%.

This report describes 1) the trends in the prevalence of supine sleeping among black and white infants in Rhode Island, and 2) the disparities in spine sleeping position among subgroups. This report also provides the most recent AAP recommendations on a safe infant sleep environment.

METHODS

Data from the Rhode Island Pregnancy Risk Assessment Monitoring System (PRAMS) were analyzed. PRAMS is a survey of recent mothers, which collects state-specific, population-based data on maternal behaviors and experiences before, during, and after pregnancy. The survey is conducted two to six months after the baby's delivery.⁶ Each year in Rhode Island, about 1,300 recent mothers complete the survey.

The 2002–2011 individual year data were analyzed to assess the trends in the prevalence of supine sleeping position for black and white infants. The 2009–2011 aggregated data were analyzed to identify disparities among subgroups. During 2009–2011, a total of 5,582 recent mothers were sampled and 3,828 completed the survey, yielding a 69.5% weighted response rate.

The infant sleep position was assessed using the following survey question: "In which one position do you most often

lay your baby down to sleep now?" Response categories included "on his or her side," "on his or her back," and "on his or her stomach."

In accordance with the AAP's recommendation, only the category of "on his or her back" (supine positioning) was examined against all other non-supine positioning. To assess the trends, the proportion of infants placed to sleep on their backs was examined by infant birth year. To assess subgroup disparities, the proportion was examined by race as well as other socio-demographic characteristics (i.e., maternal age, ethnicity, education, marital status, annual household income, and insurance type). Race groups included black, white, Asian/Pacific Islander, and other (American Indian, Alaska Native, mixed race, and other non-white). Data analyses were performed using SUDAAN software to account for the complex survey design. The linear regression analysis was performed to examine the trends. The chi-square tests and the multivariable logistic regression were conducted to determine group disparities. All statistical results presented here were weighted to represent the Rhode Island PRAMS population.

RESULTS

Trends in Supine Sleep Position

Overall, the proportion of Rhode Island infants placed to sleep in a supine position increased from 65.9% (95% CI: 62.9%–68.7%) in 2002 to 76.5% (95% CI: 73.7%–79.2%) in 2011 (16.1% increase; $p < 0.0001$ for a linear trend). In 2011, Rhode Island achieved the Healthy People 2020 target of 75.9%. For black infants, the proportion of supine positioning increased from 42.6% in 2002 to 62.0% in 2011 (45.5% increase; $p < 0.01$ for a linear trend), and for white infants, the proportion increased from 68.2% in 2002 to 83.1% in 2011 (21.8% increase; $p < 0.0001$ for a linear trend). Although the proportion of supine positioning increased significantly during 2002–2011 for both black and white infants, the gap between the two groups did not narrow significantly during the period. In 2011, black-white difference remained $> 20\%$. (Figure 1)

Supine Sleep Position and Selected Characteristics

In the cross tabulation analysis using the three-year combined data (2009–2011) shown in Table 1, the proportion of infants who were placed to sleep in a supine position varied significantly by race: 80.9% of white infants, 56.3% of black

Figure 1. Trends in the prevalence of supine sleeping among black and white infants, Rhode Island, 2002-2011

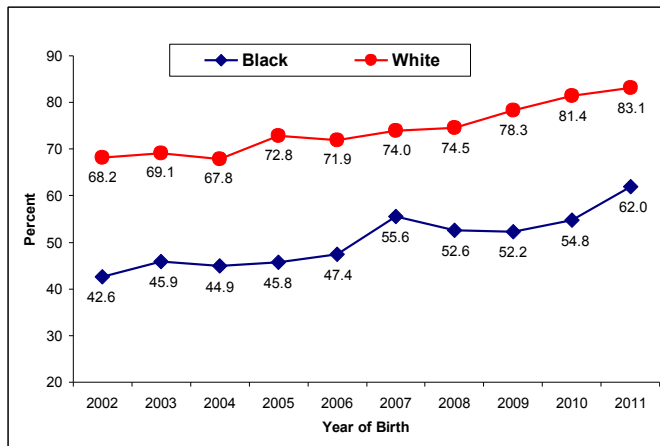


Table 1. Percent of Women Who Placed Their Infants to Sleep on Their Backs by Selected Maternal Characteristics, Rhode Island, 2009-2011, Combined

	Number of Respondents ^a	Percent ^b	95% CI ^c	P-value
State-Wide	3568	74.7	73.0-76.3	
Race				<.0001
White	2211	80.9	78.9-82.7	
Black	261	56.3	48.8-63.5	
Asian/Pacific Islander	173	78.8	70.5-85.3	
Other ^d	815	62.5	58.5-66.3	
Hispanic Ethnicity				<.0001
Hispanic	777	62.9	58.9-66.7	
Non-Hispanic	2735	78.1	76.2-79.8	
Age				<.0001
< 20 yrs	253	60.4	53.1-67.3	
20 - 29 yrs	1653	71.8	69.3-74.3	
>= 30 yrs	1662	80.5	78.2-82.5	
Education				<.0001
< High School	457	63.6	58.2-68.6	
High School	859	69.6	65.9-73.2	
> High School	2009	80.4	78.4-82.3	
Marital Status				<.0001
Married	2080	80.5	78.5-82.3	
Unmarried	1488	67.2	64.4-70.0	
Annual Household Income				<.0001
< \$10,000	588	64.8	60.0-69.3	
\$10,000 - \$24,999	682	69.5	65.3-73.4	
\$25,000 - \$49,999	623	74.9	70.7-78.7	
\$50,000/+	1417	84.0	81.8-86.1	
Health Insurance				<.0001
Public	1638	67.1	64.4-69.8	
Private	1829	82.0	79.9-83.9	

Source: Rhode Island Pregnancy Risk Assessment Monitoring System (PRAMS), 2009-2011

a: Unknown and missing categories were excluded

b: Weighted percentage

c: 95% Confidence Interval

d: includes American Indian, Alaskan Native, mixed race, and other non-white

Table 2. Adjusted^a Effects of Race on Non-Supine Sleep Positioning Rhode Island, 2009-2011, Combined

	Adjusted ^a		
	Adjusted OR ^b	95% CI ^c	P- value
White	1.0	1.0	---
Black	2.50	1.73-3.61	< .0001
Asian/Pacific Islander	0.87	0.51-1.49	0.6159
Other ^d	1.64	1.16-2.33	0.0057

a: Adjusted for maternal age, ethnicity, education, marital status, annual household income, and insurance type

b: OR: Odds Ratio

c: 95% Confidence Interval

d: includes American Indian, Alaskan Native, mixed race, and other non-white

infants, 78.8% of Asian or Pacific Islander infants, and 62.5% of "other" race infants were placed to sleep on their backs ($p < 0.0001$). The prevalence of supine positioning also varied significantly by other maternal characteristics: mothers who were older than 30 years (80.5%), Non-Hispanic (78.1%), married (80.5%), and mothers who had more than a high school education (80.4%), annual household incomes greater than \$50,000 (84.0%), and private health insurance (82.0%) were more likely to place their infants to sleep on their backs, compared to their counterparts ($p < 0.0001$ for all characteristics).

In the logistic regression model (Table 2), even after adjusting for all other covariates (maternal age, ethnicity, education, marital status, annual household income, and insurance type), the odds of non-supine positioning remained significantly higher for black infants (AOR=2.5; 95% CI=1.7-3.6; $p < 0.0001$) and for "other" race infants (AOR=1.6; 95% CI=1.2-2.3; $p < 0.01$), compared to white infants. However, Asian or Pacific Islander infants did not differ from white infants (AOR=0.9; 95% CI=0.5-1.5; $p = 0.6159$).

DISCUSSION

The findings in this report provide useful data that demonstrate the racial disparities in sleep position among Rhode Island infants. In 2009-2011, nearly half of black infants (43.7%) and more than one third of "other" race infants (37.5%) were placed to sleep in non-supine positions, compared to fewer than one in five white infants (19.1%). The rate for Asian or Pacific Islander infants (21.2%) was similar to that of white infants. The likelihood of non-supine sleeping remained significantly higher

for black and “other” race infants, compared to white infants, even after controlling for socio-demographic covariates. In this report, however, because the “other” race category includes multiple races, such as American Indian, Alaska Native, mixed race, and other non-white, it is unclear which race in the “other” category exactly had higher prevalence of non-supine positioning.

New Infant Safe Sleep Recommendations: Despite substantial declines in the non-supine positioning and the incidence of SIDS since the early 1990s, the decline in SIDS has become stagnant in recent years. Meanwhile, other causes of sleep-related deaths, including suffocation, asphyxia, and entrapment have increased in incidence. In response to these trends, the AAP has recently expanded its recommendations from focusing only on “Back to Sleep” positioning to focusing on a broad safe sleep environment that can reduce the risk of all sleep-related infant deaths, including SIDS.^{4,5} The summary recommendations include:^{4,5}

1. Back to sleep for every sleep
2. Use a firm sleep surface
3. Room-sharing without bed-sharing is recommended
4. Keep soft objects and loose bedding out of the crib
5. Pregnant women should receive regular prenatal care
6. Avoid smoke exposure during pregnancy and after birth
7. Avoid alcohol and illicit drug use during pregnancy and after birth
8. Breastfeeding is recommended
9. Consider offering a pacifier at nap time and bedtime
10. Avoid overheating
11. Do not use home cardiorespiratory monitors as a strategy to reduce the risk of SIDS.

Health care providers and other health professionals should educate all persons who care for infants (all parents, grandparents, and other infant caregivers) about these new AAP recommendations to reduce the risk of all sleep-related infant deaths, particularly black and American Indian/Alaska Native populations.

The Rhode Island Department of Health has partnered with birthing hospitals, healthcare providers, community-based organizations, state agencies, and the state’s Child Death Review Team to promote and support safe infant sleep practices in Rhode Island communities. Activities include the provision of home-based intervention, educational materials, social media, trainings for child care providers, and outreach to baby stores. Anyone can refer a family for help creating a safe sleep area in their home by contacting the family’s local First Connections provider (www.health.ri.gov/find/firstconnectionsproviders).

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Authors

Hyun (Hanna) Kim, PhD, is Senior Public Health Epidemiologist in the Center for Health Data and Analysis, Rhode Island Department of Health, and Clinical Assistant Professor in the Department of Epidemiology, School of Public Health, Brown University.

Rachel Cain, BA, is the Coordinator of the PRAMS Program in the Center for Health Data and Analysis, Rhode Island Department of Health.

Samara Viner-Brown, MS, is Chief of the Center for Health Data and Analysis, Rhode Island Department of Health and Director of the PRAMS Program.

Kristine Campagna, MEd, is the Chief of Program Development, Perinatal and Early Childhood Development, Division of Community Family Health and Equity, Rhode Island Department of Health.

Crystal Roach is an MPH candidate at the School of Public Health, Brown University.

Disclosure of Financial Interests

The authors and/or their significant others have no financial interests to disclose.

Correspondence

Hyun (Hanna) Kim, PhD
Rhode Island Department of Health
3 Capitol Hill
Providence, RI 02908-5097
hanna.kim@health.ri.gov